NATUR CYMRU
Nature of Wales

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- Wood-pasturage in the oakwoods
- Climate change and trees
- The foraging ecology of otters
- The roof of Wales
- Y dreftadaeth anweladwy
- Discovering scarce bats
- Hunting and celebrating veteran trees
- Books, News, Comment...

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NATUR CYMRU
The Nature of Wales

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Natur Cymru is intended to promote the exchange of information about biodiversity and encourage debate. If you have information, ideas for articles or artwork which you think might be of interest to readers, please contact the Editor.

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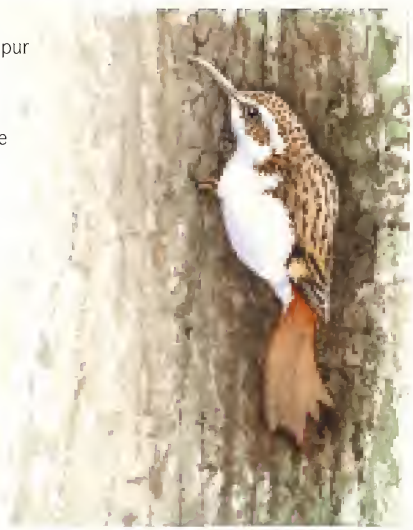

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NATUR CYMRU GOLYGYDDOL

Saith mlynedd yn ôl cafodd cynllun newydd ar gyfer coetiroedd ei lansio. *Coetiroedd i Gymru* oedd ei deitl, a'i fwriad oedd cynnig strategaeth ar gyfer coed a choetiroedd am yr hanner can mlynedd nesaf. Ar ôl saith mlynedd yn unig, roedd y weledigaeth wedi pylu i'r fath raddau nes gorfod ailwampio'r cynllun a chynnal ymarfer ymgynghori arall, a ddaeth i ben fis Hydref. Roedd angen diweddaru'r polisi er mwyn iddo gyd-fynd â newidiadau mewn polisïau eraill, er enghraifft dogfen Cymru'n Un a Strategaeth Amgylcheddol y Cynulliad, ynghyd â phwysigrwydd cynyddol newid hinsawdd.

Diflannodd fy amheuon yn fuan wedi imi ddechrau darllen y ddogfen ymgynghori. Bron bob tro y cefais fy ngwahodd i gytuno'n gryf â rhyw gynnig neu'i gilydd, roeddwn yn berffaith fodlon gwneud hynny. A oes yna unrhyw un nad yw eisiau gweld coetiroedd mwy amrywiol, gan gynnwys dulliau rheoli amrywiol? A oes yna unrhyw un na fyddai'n falch o gael gwybod mai rheolaeth gorchudd di-dor yw'r dull rhagosodedig o reoli coetiroedd? Neu unrhyw un na fyddai'n croesawu camau i leoli a gwarchod coed hynafol?

Mae'r rhifyn yma'n ymdrin â nifer o bynciau sydd wrth galon a chraidd y ffordd y caiff coetiroedd eu rheoli. Sut allwn ni addasu ein coetiroedd er mwyn gwneud iddyn nhw ymateb i newid hinsawdd? Duncan Ray a Richard Carrick o'r Comisiwn Coedwigaeth sy'n cnoi cil dros y cwestiwn pwysig yma. Hefyd, ceir dwy erthygl yn ymdrin â choed hynafol: fforiwr sy'n gwbl angerddol o blaid coed hynafol yw Yun Hider; ac mae Chris Hickman yn helpu i gynnal yr Helfa Coed Hynafol – rhywbeth sy'n dda i'r organeddau hynod yma ac yn hwyl i'r rheini sy'n cymryd rhan.

Rhywbeth a aeth â 'mryd yn llwyr oedd awgrym George Peterken nad yw coedydd derw'r ucheldir yn benllanw llystyfiant 'coedwigoedd glaw' fel y tybiwn ac nad oes angen inni, mewn gwirionedd, reoli'r coetiroedd yma mor ddwys, o fewn cyd-destun brithwaith coetiroedd sy'n newid yn barhaus ac sy'n gysylltiedig mewn termau ecolegol.

Mae hyn yn fy nhywys yn ôl at y Strategaeth Coetiroedd. Yn y gorffennol, mae'r Comisiwn Coedwigaeth wedi gweithio'n galed i droi twyndiroedd yn goedwigoedd. Felly, bydd y cynnig i gynyddu arwynebedd coetiroedd yng Nghymru yn bwysig iawn iddyn nhw. Fe allai hyn fod yn ddadleuol. Coedwigoedd ynteu tir fferm – dyma rywbeth sydd wedi bod yn ddraenen barhaus yn ystlys llunwyr polisïau defnydd tir ers adeg y rhyfel. Mae cystadleuaeth drwy'r byd am fwyd yn ychwanegu at y pwysau ar dir fferm. (Bwyd a ffermio fydd thema rhifyn y Gwanwyn, gyda llaw.) Efallai na fydd cael llinell derfyn rhy bendant rhwng y ddau beth – o ran polisi ac ar lawr gwlad – yn ffordd ddelfrydol o ddod â mwy o goed i Gymru.

Rydw i'n nerfus hefyd ynghylch y pwyslais anochel ar blannu a chreu cynefinoedd coetiroedd sengl. Does dim byd gwell na thirwedd goediog lle gwelir coed o bob oed wedi'u britho â chynefinoedd agored o bob math, gan gynnwys llennyrch tebyg i ddolydd, rhosydd a chorsydd. Mewn llefydd o'r fath, mae'r coed yn cynnig cysgod ac yn cyfoethogi'r ardal, gan gynnig nifer o swyddogaethau hollbwysig – er enghraifft darparu pren, helpu bywyd gwyllt, storio tanwydd, cronni carbon, rheoli dŵr, dal ynni ac yn y blaen. Mae coed a choedwigoedd, ynghyd â gwrychoedd trwchus, corneli o brysgwydd a darnau o dir garw, o fudd mawr i fywyd gwyllt, gan gynnig coridorau hedfan i ystlumod a lloches i ddyfrgwn. (Mae diet dyfrgwn yn cael ei drafod yn y rhifyn yma hefyd.) Gobeithio y bydd y pwyslais derbyniol yma ar goetiroedd brodorol newydd yn arwain at dirwedd fwy cydgysylltiedig sy'n llawn coed, lle gall coed eu plannu eu hunain a lle gallwn ninnau fanteisio ar eu haelioni.

James Robertson

NATUR CYMRU EDITORIAL

Seven years ago a new blueprint for our woodlands was launched. Called *Woodlands for Wales*, it promised to be a 50-year strategy for trees and woodlands. After only seven years, the vision has become opaque enough to require a revamp and a further consultation exercise, which finished in October. The policy needed to catch up with other policy changes, such as the Assembly's Environment Strategy and One Wales document, and the rising importance of Climate Change.

My initial scepticism quickly evaporated when I read the consultation document. On almost every occasion that I was invited to strongly agree with a proposal, I was happy to do so. Who would not want to see greater woodland diversity in all its forms, including diverse management? Or be pleased that continuous cover management is the 'default setting' for how woodlands are managed? Or welcome measures to locate and protect veteran trees?

A number of important subjects at the heart of the woodland debate feature in this edition. How can we adapt our woodlands to respond to Climate Change? Duncan Ray and Richard Carrick, of the Forestry Commission, give this question careful consideration. Two articles deal with veteran trees: Yun Hider is a forager who has developed a passion for ancient trees; Chris Hickman helps to run the Ancient Tree Hunt, which is both good for these extraordinary organisms, and fun for those involved.

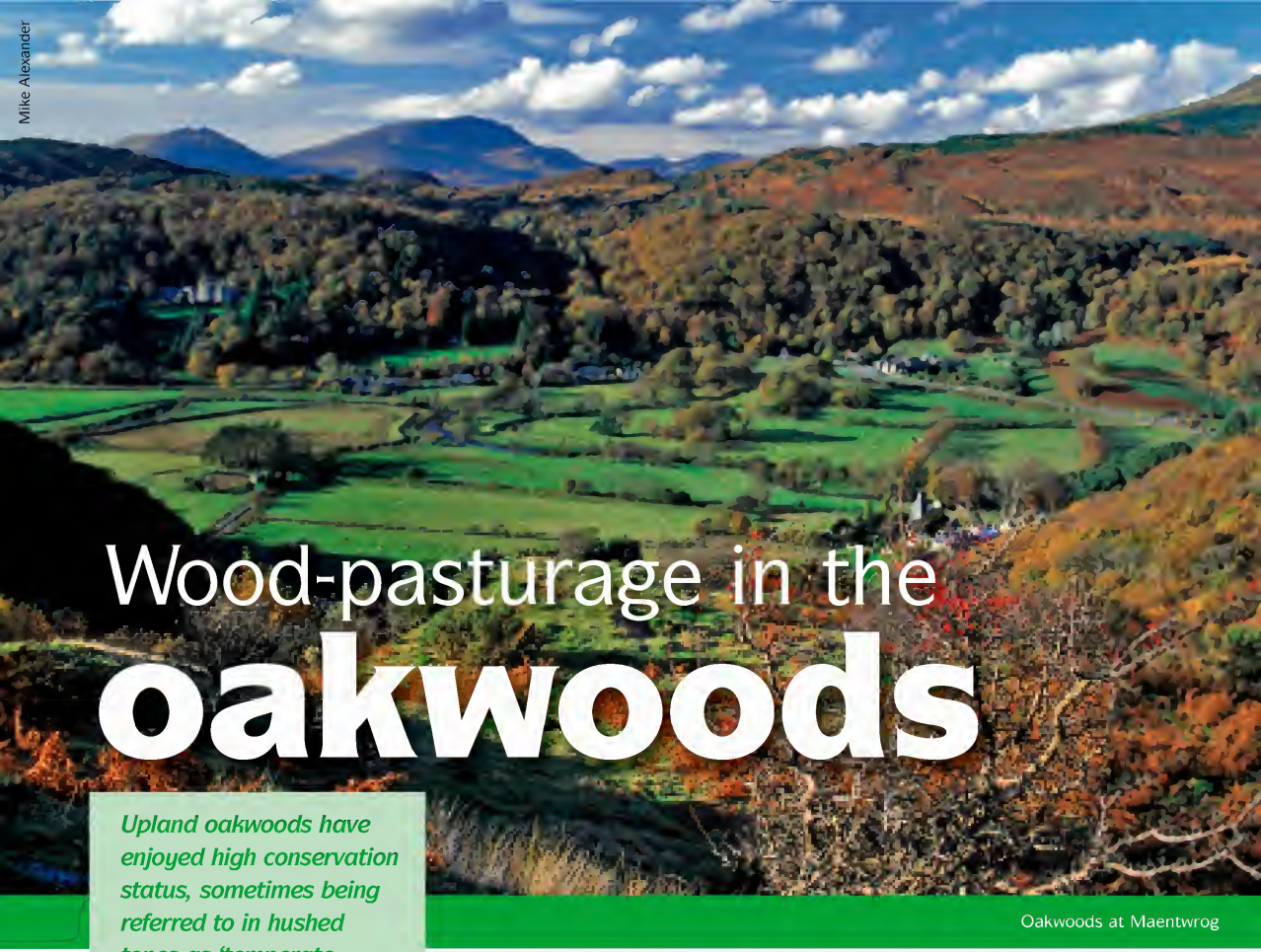
Mandy Marsh

I was particularly seized by George Peterken's suggestion that our upland oakwoods may not be quite the 'temperate rainforest' climax vegetation that we like to think they are; and that we could be more relaxed about the way we manage some of these woodlands, within the context of a constantly changing, ecologically connected woodland mosaic.

This brings me back to that Woodland Strategy. Historically the Forestry Commission has worked hard to increase the area of land down to forestry, so the proposal to increase woodland cover in Wales will be very important to them. This could be contentious. Forestry versus farmland has been the bane of post-war land-use policy. Global competition for food is adding to the pressures on farmland (food and farming will be the theme of the Spring edition of the magazine). A stark divide between the two, in policy responsibilities and on the ground, may not be the ideal way to bring about more trees in the landscape.

I am also nervous of the inevitable emphasis on planting, and on creating single woodland habitats – there is nothing to beat a wooded landscape in which trees of all ages are interspersed with open habitats of all kinds, from meadow-like glades to heaths and bogs. In such places trees shelter and enrich the scene, performing many vital functions along the way, as timber providers, wildlife reservoirs, fuel stores, carbon sinks, water regulators, energy capturers and so on. Trees and woods, along with thick hedges, scrubby corners and rough patches, are great for wildlife, providing flight corridors for bats and cover for otters – scarce bats and the diet of otters also features in this edition. I hope that the welcome emphasis on new native woodland results in a more joined-up, well-treed landscape, in which trees can plant themselves, and we can share in their bounty.

James Robertson



Mike Alexander

Wood-pasturage in the oakwoods

Upland oakwoods have enjoyed high conservation status, sometimes being referred to in hushed tones as 'temperate rainforests'. So it may come as a shock that many may be closer to plantations than to the original vegetation which occupied their sites over many centuries. As ***GEORGE PETERKEN*** *discusses, a greater understanding of the history of these woodlands offers the freedom to manage them more flexibly, as well as to value the surviving fragments of wood-pasture more highly.*

Oakwoods at Maentwrog

Under the leadership of R. Elfyn Hughes, the early Nature Conservancy acquired a representative series of 'western oakwoods' as National Nature Reserves, and to this day much of the discussion on woodland conservation emanating from Wales revolves around these sessile oak-dominated stands, their rich assemblages of bryophytes and lichens, and their contribution to beautiful landscapes. Foresters, however, have often raised eyebrows when they are described as 'semi-natural', claiming that they are merely plantations, and even conservationists recognise that their ground vegetation and tree cover is often tediously uniform.

In Wales and elsewhere in Britain's western hills, there is now wide recognition that wood-pasturage played a much greater part in the history of these woods than we had formerly realised. Take, for example, the extensive oakwoods around Loch Sunart, which appear even-aged and often show signs of past coppicing. Old maps demonstrate that many, if not most, originated as plantations in the 18th and early 19th centuries. Within them, however, are numerous signs of a varied past, not only ancient pollards and stubs, but also numerous archaeological remains of former occupation and traditional farming (Dye et al 2001).

Moreover, the pasture around the woods includes several fine remnants of ancient wood-pasture. Clearly, the dense oakwoods were inserted into a traditional farming landscape with wood-pasture containing oak with alder, birch, hazel and ash.

This pattern was broadly confirmed by Philip Sansum's pollen analysis within similar oakwoods at Loch Awe. One thousand years ago mixtures of birch, oak, hazel and alder covered much of the ground, but from about 1200 the land must have been open, with fluctuating amounts of hazel, alder and limited amounts of birch and oak. Tree cover increased considerably from the early 19th century, mainly birch at first, but latterly mainly oak, which is now more dominant than at any time in the last thousand years.

Much the same transition from wood-pasture to closed oak woodland can be seen in Cumbria and south-west England. In Borrowdale, the mixed coppices recorded by the Duchy of Lancaster in 1587 were eventually replaced by the fine oak-dominated woods we see today, and this transition is duly confirmed by John Birks' pollen diagram from Johnny's Wood, which shows oak now at its highest proportion for millennia, and hazel at its lowest. Exmoor oakwoods, such as those in the Barle Valley and the Holnicote-Horner estate, are mainly even-aged, but include significant remnants of an earlier wood-pasture phase. Even at the famous Wistman's Wood on Dartmoor, Richard Bradshaw's pollen analysis confirmed our inference that before 1600 there was a substantial representation of grasses, ferns, heather and rosaceous shrubs (rowan and hawthorn presumably) within mixed woodland of oak, hazel, birch and alder, whereas after 1600 oak and ivy increased hugely whilst other trees, shrubs, ferns and herbs were much reduced.

Evidence in Welsh oakwoods

Turning to Wales, Mary Edwards (1986) found considerable variety in the history of Snowdonia oakwoods, but demonstrated that they, too, had been far more open than they are now. At Coed Cymerau, now an even-aged oak stand, pollen deposits show a massive increase in tree pollen in modern times, herbs having previously been dominant. At Coed Ganllwyd, the oak-dominated stand is also even-aged, originating in the first half of the 19th century. From 1000 to 1650 oak was present with other trees and shrubs, but herbs were well represented. Thereafter, oak was thinly scattered amongst birch and shrubs until, after 1800, it increased rapidly to what is now its highest representation in the last eleven hundred years, whilst shrubs and herbs have fallen to a minimum. Likewise at Coed Llenyrch, the present 1940s oak stand was preceded by three centuries

Mandy Marsh

Old and new plantations around Loch Sunart

when trees and shrubs must have been very thin on the ground. Before 1600, however, woodland was evidently dense, with some shrubs, but almost no herbs.

The general pattern of modern oak-dominated woods having a prolonged earlier open phase and an earlier mixed composition was even recognised at the distinctive Coed y Rhygen, where the oak stands have a varied structure with trees up to 350 years old. Here, again, trees currently contribute a higher proportion of the pollen rain than at any time in the last 1600 years, but over the centuries the proportions of tree and herb pollens have fluctuated enormously, and the presence of *Plantago* pollen indicates that ground was cultivated nearby in medieval and later periods. The antecedents of the modern wood were thus parkland of fluctuating density, associated with traditional farming.

These are the researched examples of histories that must have been common in upland Wales. As William Linnard (2000) says, "Providing pasture for livestock was one of the most important of all the functions of forests and woods, and indeed remained so until comparatively recently" (p.47). Indeed, one suspects that it ceased only when the coppices and plantations were established. The broad history of western oakwoods must therefore form four phases: (1) original-natural woodland with limited open spaces, at least on steep slopes; (2) wood-pasture developing in prehistory as a mosaic of open and tree-covered ground; (3) coppice and high forest formed by enclosure and planting in post-medieval times; and (4) minimal silvicultural intervention with sheep-grazing.

This history was not confined to west Wales. The Trellech plateau, in south-east Wales, was largely occupied by a great stretch of wood-pasture in medieval times, different parts of which have gone their different ways since the 16th century (Peterken 2008). Earlswood became coppice then was cleared to agriculture. Coed Llyfos went directly to agriculture. Wentwood, Chepstow Park, the Fedw, Bargain Wood and others passed through coppice variously to beech, oak or conifer high forest. Wyeswood was steadily denuded of trees until enclosure in 1810, by which time it was a grass-heath: now it is a mosaic of farmland, plantations and relict heaths (Cleddon Bog, Whitelye Common). As in most of the western oakwoods, but unlike most of the Wye Valley woods with a long coppice history, small-leaved lime was eliminated or confined to the margins.

Implications

Grazing in early wood-pasturage, planting in recent centuries, and the limited powers of spread of some woodland species have combined to simplify the structure and composition of many native woodlands from intimate mixtures to even-aged near-monocultures. We need to take account of this in our management. Some diverse, mixed woods, such as the Wye Valley woods with a long coppice history, are still close to their original-natural (i.e. late Mesolithic) composition, and here we should ensure that the mixtures remain with an element of natural regeneration. Some near-monocultures, such as wet alder woods, may also reflect natural conditions. However, many western oakwoods must, with the beechwoods of south-east England, be amongst the least natural of the woodlands we describe as semi-natural, and in these we can afford to take a far more flexible view of future management.

Conversely, the remnants of wood-pasturage should be more highly rated and carefully managed than has perhaps been the case. Around Loch Sunart, for example, the former oak plantations were notified as SSSIs, but the wood-pasture remnants were unfortunately excluded. In Wales, it's not just the old parks that should be recognised, but also the informal clusters of old trees in pasture and concentrations of mature boundary trees. As mosaics of woodland, grassland and heathland patches with diffuse boundaries, these must represent greater continuity with traditional habitats than sharp-edged, pure oak woods.

The present even-aged dominance of oak and/or birch in the oak woods themselves is generally more artificial that we have often cared to admit, but this allows freedom to diversify structure and composition, and perhaps an obligation to do so in woods managed primarily for conservation. One should, of course, retain

Natural England/Paul Glendell

Lichens in Wistman's Wood, Devon

oak as a major species and perpetuate a strong element of maturity, but we can be relaxed about semi-natural trends, such as partial replacement of oak by birch, ash or beech (which I suggest should be treated as a *de facto* native, even where it is spreading from planted stock).

Whether one should recommend a return to wood-pasturage is a matter for debate. Continued use of woods as densely-stocked sheep pasture seems unwise, but if the grazing can be moderated and/or cattle can be depastured in woods, the outcome should be a rich and varied mosaic of habitats. This would be a particularly good target where the land available includes wet-ground and low-lying herb-rich pasture.

A final thought relates to landscape-scale dynamics. The former wood-pastures were not just structurally diverse, but the mosaic of trees and woodland must have been constantly changing. Accordingly, it is worth considering opportunities to regenerate oak woodland (*sens. lat.*) outside existing woods, whilst accepting some attenuation of existing woods. Coed y Brenin Forest, for example, always had a sprinkling of oaks, birch and rowan regenerating vigorously amongst the planted conifers, and this took the edge off concerns for the regeneration of oak in the nearby Coed Ganllwyd. Perhaps that is the key: if we have more wooded ground with less ecological isolation, we can enjoy a more relaxed and dynamic approach to the conservation of native woodlands in Wales.

***George Peterken OBE** is President of Gwent Wildlife Trust. Formerly Woodland Ecologist at the Nature Conservancy Council, he is author of numerous books and articles on woodland ecology. He lives on a smallholding close to the Wye gorge and his latest book,* Wye Valley, *is reviewed on p.45.*

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Hanes yn creu posibiliadau newydd

Mae tystiolaeth o'r Alban, de-orllewin Lloegr a Chymru yn dangos mai gweddol ddiweddar, ers dechrau'r 19egG, y datblygodd coedwigoedd deri trwchus yr ucheldir. Cynt roeddent yn rhan o dirlun amaethyddol agored gyda phorfa goediog gymysg. Awgrymir mai pedwar cyfnod sydd wedi bod yn hanes coedwigoedd deri gorllewinol: coedwig wreiddiol naturiol gydag ond ychydig o fannau agored, o leiaf ar lethrau serth; porfa goediog, yn frithwaith o dir agored a thir coediog; fforest uchel a choetir wedi bondorri, a grëwyd drwy gau tir a phlannu ar ôl y canol oesoedd: fforest heb fawr ddim ymyrraeth heblaw pori gyda defaid.

Gan nad lled-naturiol yw llawer o'r coedwigoedd deri hyn, gallwn fod yn fwy hyblyg wrth eu rheoli, gan ymyrryd i amrywio'r strwythur unffurf artiffisial a phoeni llai am yr hyn a ddaw i dyfu ochr yn ochr â'r deri. Mae gweddillion porfa goediog, gyda'u brithwaith o goetir, glaswelltir a gweundir, yn fwy gwerthfawr efallai ac mae angen eu rheoli'n fwy gofalus – boed yn hen barciau neu'n glystyrau o goed mewn caeau ac ar hyd terfynau. Mae dadl dros greu rhagor o'r cynefin amrywiol hwn, yn enwedig mewn mannau lle mae tir gwlyb a phorfa llawn blodau gwyllt. Dylid ystyried hefyd ei greu y tu hwnt i ffiniau coedwigoedd presennol er mwyn cael rhagor o goetir yn y tirlun a gwella cysylltedd ecolegol.

Hunting ancient trees

Mandy Marsh

Ancient oaks on Any Kehoe's farm - do these trees date back to Cromwell's time?

A complex ecosystem can flourish on an individual tree, which may have been part of human history over many centuries. Ancient trees are undeniably special, but they have never been systematically recorded, nor has their significance been documented. A project is putting this right, as ***CHRIS HICKMAN*** *explains.*

When people ask what my job is I will more often than not say 'a tree hugger'. Now this is not true strictly speaking, but I do it to prompt the usual reaction of laughter and a degree of incredulity. But when I actually begin to describe what the Ancient Tree Hunt does, the reaction will change from scepticism and mocking to interest and a real keenness to get involved. With 22,000 trees recorded in just over a year, it is clear that once people get hooked, they are captivated by the hunt for our ancient trees.

What is it about?

For anyone unfamiliar with the premise, the Ancient Tree Hunt is a five year nationwide project to record 100,000 trees on an online database. Once recorded the trees are then classified as ancient, veteran or notable depending on their estimated age. It is very much about getting as many members of the public involved as humanly possible, as there are a lot of trees in the UK and we need people from all corners to locate and record their ancient trees.

Before the project began there was no existing database of ancient trees across the UK and likewise there is no real protection for these living relics in the way that old buildings can be listed. So by the end of the project it is hoped that, armed with all the data collated over the course of its five year lifespan, some form of official protection can be achieved as a result.

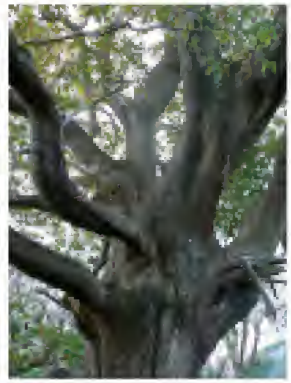
Aside from the serious business of tree protection, the Ancient Tree Hunt is a great project to involve anyone and everyone, from six to 60. It can be done alone, in pairs or with the whole family and the participation so far has covered the entire gamut of human life. In Wales so far we have a grand total of 1,650 trees recorded across the length and breadth of the country.

The idea is to create a living map of unique records, containing photos, blogs and historical information on every individual tree recorded in the country. Wales is a country steeped in Celtic history and through the project we have been able to unlock some of those stories and meet fascinating individuals.

The people

The volunteer verifiers are the heartbeat of the project; quite simply, if it wasn't for their dedication the Ancient Tree Hunt would not exist. Every record added by a member of the public has to be verified. This involves the verifier gleaning as much information on the location of the tree as possible before going to the site. For trees close to obvious landmarks or in gardens this does not prove much of a problem. When the tree is in woodland or rolling fields however, the situation is altogether more complicated. Many a time a verifier has been led on a wild goose chase for several hours on the hunt for an elusive crack willow or hawthorn in the wilds of the Brecon Beacons or Snowdonia. Nonetheless, the team of 18 volunteers scour the Welsh countryside for the hidden ancient gems for 52 weeks of the year without fail.

Rob McBride is one such individual who has visited sites across north Wales and Cheshire to verify the records that are added by the public. He has also volunteered his time to attend Ancient Tree Hunt (ATH) events across the country, including the Hay



Festival and a reception at the House of Commons. And, in perhaps the ultimate show of dedication to the cause, Rob is currently walking the entire length of the 182 mile Offa's Dyke Path and recording any trees he finds on the way. You may wonder why people would even consider becoming a verifier in their spare time with no real incentives other than plenty of fresh air and walking. Rob explains why he got involved:

In 2004 I was very poorly and was prescribed fresh air and exercise by my GP. At this time I also met Shaun Burkey, a conservation officer from Shropshire County Council, who enrolled me as a tree warden. The Ancient Tree Hunt has enabled me to learn and understand more about how fantastically special these ancient trees are. Their value for biodiversity is now understood to be virtually unequalled.

I see the landscape in a completely different way now. There are some fantastic old hedgerow pollards very close to a factory where I worked for over 20 years. Before being involved in the ATH I had not even noticed them! This very special area is called Ridley Wood, or Is Y Coed. Part is now a large industrial estate but the area to the east has no major roads, just lots of small lanes petering out and gradually going down to the river Dee. This seems to have saved the trees from developers.

I was puzzled to see that some of the hollow trees have concrete inside them, until a local farmer, who is 80 years old, explained it to me. During the Second World War there was a massive munitions factory here and the Ministry of Defence was in charge of the land. The trees were filled with concrete to prevent incendiary bombs falling inside them and setting them ablaze – a dangerous prospect so close to the factory!

Rob McBride

Concrete-filled trees at Ridley Wood

Other peculiar specimens Rob has discovered include an oak pollard nearly ten metres in girth at the 'Gate of the Dead.' The field opposite this tree is believed to be the site of a 12th century battle where English forces were ambushed and defeated by the Welsh. It is said that the field has never been ploughed since and contains bodies from the battle. Nearby is a seven metre oak called 'the duelling tree' where duels were once fought.

The trees

Tree records will appear from all sources; partner groups who may hold large amounts of existing data, landowners and members of the public too. Public involvement is crucial in any nationwide project and so looking after recorders once they first come on board is all part of the role of the verifier. One such instance came earlier this year when a letter was received from a member of the public in Monmouthshire who described a tree in the garden of the house she had lived in "for most of my 95 years". The volunteer verifier in the area, Tom Seymour, paid her a visit and ended up spending the afternoon sitting in front of her 100 year old range drinking cups of tea. She turned out to be a member of the Gaia Society and the International Tree Foundation to boot!

Lichens

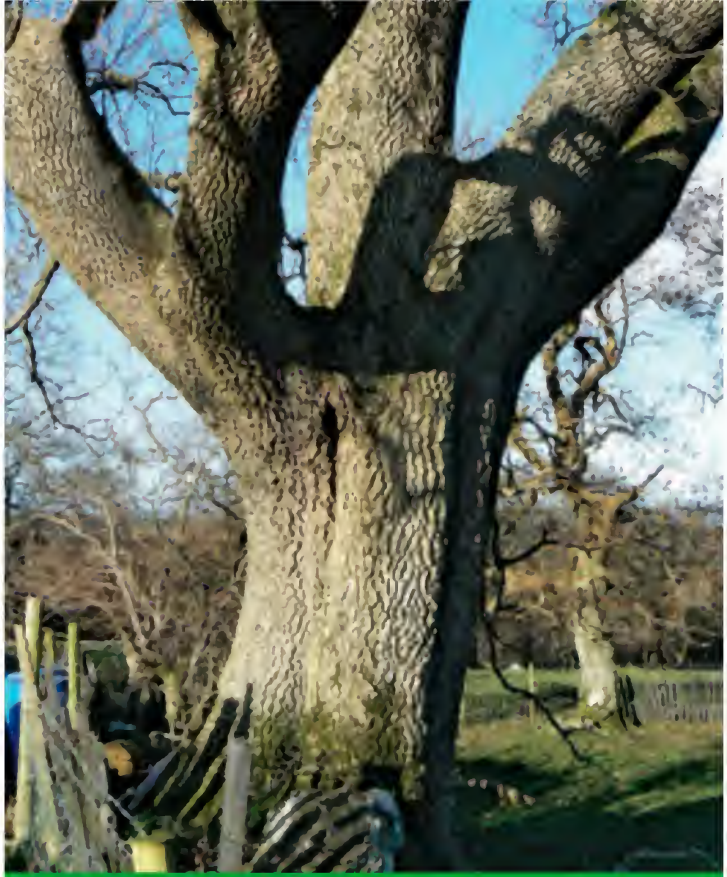
Mature and veteran trees can play host to some fantastic lichens in parts of Wales where the air is clean, away from industrial pollutants. One of the most familiar, which adds splashes of bright orange-yellow to rocks and trees, especially near the coast, is the common orange lichen *Xanthoria parietina*.

Old trees seen in the Elan Valley drip with lichen, making them resemble a character from *The Lord of the Rings*. One important lichen which is reliant on old growth is the tree lungwort *Lobaria pulmonaria* (*Natur Cymru* 24, p29), with a cabbage-like surface featuring protruding veins, much like our own lungs, and once used to treat lung diseases. This very important lichen may disappear in time if we don't look after our old trees; they are the part of our Celtic landscape history and link us to the past.

Involving landowners

The project has also been making great strides with landowners, many of whom may initially be reluctant to get involved in recording trees for the project. The crucial point to communicate is that the database is merely a recording tool. Adding records does not automatically mean that landowners will then be forced to maintain the trees or have the details passed onto third parties. The Ancient Tree Hunt wants to help landowners and advise them on best practices so that we can maintain these magnificent specimens long into the future.

Mandy Marsh



An ancient ash on the Kehoe farm

One such landowner in Wales is Andy Kehoe, who owns a 120 acre farm near Bangor. There are 15-20 trees on the estate which may date back to the time of Oliver Cromwell in the 1600s. The farm has been in his family for over 150 years and has been passed down through the generations. Andy explains:

These trees provide a link from the past to the present and future generations. And if one of my family takes over the farm after me, that link will continue into the future. My uncle used to say that some of these trees were standing at the time when Cromwell's troops fought a battle down on the coast at Abergwyngregyn over 300 years ago.

With three years left to run, the project should continue to flourish, but this depends on the support of the public, partners and landowners. With another estimated 75,000 trees to add to the database, there are plenty out there waiting to be discovered, which is why we want your help. For more information visit the Ancient Tree Hunt website: **www.ancient-tree-hunt.org.uk** or call **08452 935 581**.

***Chris Hickman** is the Ancient Tree Hunt project assistant with Coed Cadw - The Woodland Trust.*

Chwilio am Hen Gymeriadau

Maen nhw mor wych a gwerthfawr â hen adeiladau, ond nid oes gennym system i'w cofrestru a'u gwarchod. Dyna'r gwir am hen goed. Ond efallai gall yr 'ancient tree hunt' newid hynny, os cesglir digon o wybodaeth dros y dair blynedd nesaf. Cofnodwyd 1,559 o hen goed yng Nghymru, hyd yma. Bwriedir creu map byw o gofnodion gyda lluniau, blogiau a hanes am bob coeden ungiol. Mae 18 o wirfoddolwyr wrthi'n feunyddiol yn crwydro Cymru i wirio cofnodion. Mae'n ffordd o gadw'n iach ac o weld rhyfeddodau, fel y dderwen sy'n mesur 10m o gylch ei chanol ger Porth y Meirw, lle'r ymladdwyd un o frwydrau'r gororau nôl yn y 12fedG. Mae'r cennau sy'n tyfu ar rai o hen goed Cymru yn ddigon o sioe. Mae'r coed yn cynnig mân-gynefinoedd i bob math o blanhigion a chreaduriaid ac mae rhai o'r cennau mwyaf nodedig, fel llysiau'r ysgyfaint, ond yn tyfu ar hen goed, mewn ardaloedd ag awyr lân.

Mae deiliaid tir yn allweddol i'r gwaith. Nid cynyddu pwysau arnynt yw nod y prosiect, ond yn hytrach eu helpu drwy gynnig cyngor ynglŷn â sut i ofalu am hen goed gwych, fel y rhai hynny ar fferm ger Bangor sy'n dyddio nôl i gyfnod Cromwell. Mae un gwirfoddolwr yn bwriadu cerdded Clawdd Offa i gofnodi'r holl hen goed ar ei hyd. Does dim rhaid i bawb fod mor uchelgeisiol ond mae digon o gyfle i chithau hefyd helpu. Ewch at www.ancienttreehunt.org.uk neu ffoniwch 08452 935 581.

Y dreftadaeth anweladwy

Mike Alexander

Pont Abermo dros aber Afon Mawddach
Barmouth bridge over the Mawddach estuary

A ddylai pwrpas Parc Cenedlaethol gwmpasu treftadaeth ddiwylliannol yn ogystal â'r amgylchedd naturiol a'r tirlun? Bu trafod brwd ynglŷn â hyn ers tri degawd a mwy. Sylweddolir bellach bod gwarchod y dreftadaeth ddiwylliannol yn hanfodol os ydym am lwyddo i fyw'n gynaliadwy ar ein daear. Mae ystyr 'treftadaeth ddiwylliannol' hefyd yn gliriach erbyn hyn. Yn yr erthygl hon mae ***TWM ELIAS*** *yn adolygu'r drafodaeth am y pwnc diddorol hwn.*

Yn un o gynadleddau blynyddol y Parciau Cenedlaethol, a ddigwyddai gael ei chynnal ym Mhlas Tan y Bwlch yn 1979, y cefais i brofiad gynta o'r ddadl ddifyr honno am warchod ein treftadaeth ddiwyllianol.

Pan sefydlwyd Parciau Cenedlaethol[1] doedd dim sôn am dreftadaeth ar y cyfryw. Eu hamcanion gwreiddiol oedd:

- Gwarchod a hyrwyddo harddwch naturiol yr ardaloedd a gymeradwywyd fel Parciau Cenedlaethol;
- Annog darparu neu wella cyfleusterau ar gyfer mwynhau gweithgareddau awyr-agored ac astudiaeth o natur o'u mewn.

Heblaw am roi sicrwydd na ddylid amharu ar fywoliaeth yr amaethwyr ac eraill a drigai o fewn ffiniau'r Parciau newydd 'doedd dim sôn am dreftadaeth a diwylliant trigolion y Parciau.

Prif ganlyniad yr adolygiad cyntaf o'r amcanion hyn yn 1974, dan gadeiryddiaeth yr Arglwydd Stanford, oedd sefydlu'r egwyddor y dylai'r amcan cyntaf yn Neddf 1949 gael blaenoriaeth dros yr ail petae gwrthdaro yn digwydd rhyngddynt, a chadarnhawyd eto y dylid gwarchod buddiannau economaidd a chymdeithasol y rhai oedd yn byw ac yn gweithio o fewn ffiniau'r parciau. Dim sôn, eto, am dreftadaeth na diwylliant.

Y diffyg hwn ysgogodd y drafodaeth frwd yng nghynhadledd y Parciau ym Mhlas Tan y Bwlch yn 1979 pryd y daeth dau safbwynt gwahanol iawn i'r amlwg. Yng ngolwg rhai, fel Merfyn Williams a Huw Roberts o Eryri, roedd yr amcanion fel yr oeddent yn annigonol iawn oherwydd y diffyg cydnabyddiaeth o bwysigrwydd diwylliant y bobol drigai yn y Parciau. Onid y nhw, dros genedlaethau maith o amaethu ayyb, oedd wedi creu ac a oedd yn dal i gynnal yr union dirluniau a'r cynefinoedd amrywiol a chyfoethog yr oeddem ni mor awyddus i'w gwarchod? Os felly, oni haeddai integriti cymdeithasol a diwylliannol unigryw pobl y gwahanol ardaloedd, a'u hiaith yn ein hachos ni, gael eu gwarchod cystal ag unrhyw blanhigyn neu bryfyn prin?

Yn groes i hynny dadleuwyd nad oedd materion o'r fath yn rhan o fusnes y Parciau am nad oeddent yn dod o dan reolaeth gynllunio, yn warchodfeydd natur nac yn henebion cofrestredig. Cymaint oedd y teimladau ar y ddwy ochr nes buan y datblygodd y drafodaeth yn ddadl danbaid ac yn ffraeo bron hyd at waed yn y bar gyda'r nos.

Bu'n rhaid aros tan yr ail adolygiad o amcanion y Parciau, dan gadeiryddiaeth yr Athro Ron Edwards[2] cyn y cydnabyddwyd y dylai ein treftadaeth ddiwyllianol gael sylw. Ymgorfforwyd argymhellion Edwards yn Neddf yr Amgylchedd 1995 a dyma yw sail amcanion (neu bwrpasau) presennol y Parciau Cenedlaethol drwy Gymru a Lloegr. Mae gan Barciau yr Alban eu hamcanion cyfatebol eu hunnain.

Ers 1995, felly, pwrpas cyntaf Parciau Cenedlaethol Cymru a Lloegr ydi: *Gwarchod a gwella harddwch naturiol, bywyd gwyllt a threftadaeth ddiwyllianol yr ardal.*

Dyma, yn sicr, gam bras ymlaen, ond nid oedd hyn wedi codi o wagle. Roedd yn adlewyrchu'r sylweddoliaeth gynyddol yn y cyfnod hwnnw y dylai gwledydd y byd gofleidio egwyddorion cynaladwyedd os oeddent am osgoi trychineb amgylcheddol fyd-eang yn y dyfodol. Daeth egwyddorion cynaladwyedd i amlygrwydd yn y blynyddoedd oedd yn arwain at Gynhadledd y Cenhedloedd Unedig yn Rio De

Huw Jenkins

Carreg fedd o'r bumed ganrif ym Mhenmachno
Fifth century gravestone at Penmachno

Janeiro yn 1992 ar Ddatblygiad a'r Amgylchedd. O'r gynhadledd honno y deilliodd rhaglen weithredu 'Agenda 21' (y 21 yn cyfeirio at yr 21ain ganrif) a fabwysiadwyd gan 179 o lywodraethau'r byd, gan gynnwys Llywodraeth Prydain.

Conglfaen Agenda 21 yw cynaladwyedd, a chydnabod bod yr amgylchedd, cymunedau a'r economi yn gyd-ddibynnol. Dyma gydnabod, felly, bod y sgiliau a'r ddealltwriaeth sy'n rhan o ddiwylliannau byw rheolwyr tir y presennol, boed yng Nghymru neu'r Amazon, yn hanfodol er gwarchod ein dyfodol.

Er mwyn cyflawni addewidion Agenda 21 dechreuwyd datblygu polisïau economaidd, amgylcheddol a chymdeithasol fyddai yn cael eu gweithredu yn genedlaethol ac yn lleol. Daeth arbed egni, lleihau gwastraff ac ailgylchu yn bwysig. Daeth y gair bioamrywiaeth i'n hiaith (cyhoeddwyd Cynllun Gweithredu Bioamrywiaeth Eryri yn 1999 – y cyntaf i'w gyhoeddi yng Nghymru) ac yn y flwyddyn 2000 neilltuwyd arian o'r Cynulliad Cenedlaethol newydd yng Nghaerdydd i sefydlu Cronfeydd Datblygu Cymdeithasol, (Cronfa CAE yn Eryri). Roedd y rhain yn fentrau arbrofol, dan ofal y tri Pharc Cenedlaethol Cymreig ynghyd â'r Ardaloedd o Harddwch Naturiol Eithriadol, a'u bwriad oedd hybu cynlluniau cynaladwy fyddai o fudd cymunedol, economaidd ac amgylcheddol.

Huw Jenkins

Giât haearn draddodiadol ym Meirionnydd • A traditional iron gate in Meirionydd

Yn y cyfamser roedd datblygiadau ymarferol eraill eisoes ar y gweill i hybu'r dreftadaeth ddiwyllianol, e.e. yn Sir Benfro gwelwyd sefydlu Cynllun Ogam yn 2001, oedd yn bartneriaeth rhwng Menter Iaith Sir Benfro, Awdurdod Parc Cenedlaethol Arfordir Penfro, Cyngor Cefn Gwlad Cymru a nifer o fudiadau lleol. Bu Ogam yn ymwneud â nifer o brosiectau, yn cynnwys casglu a mapio enwau lleoedd yn ddigidol, dehongli llwybrau a hybu gweithgareddau diwyllianol a chymdeithasol.

Yn 2004, cyhoeddwyd *Adolygiad o Awdurdodau Parciau Cenedlaethol yng Nghymru* ar gyfer Llywodraeth y Cynulliad. Ynddo cydnabuwyd pwysigrwydd 'cymeriad diwyllianol' y tri Pharc Cymreig, gyda phob un yn dangos ei nodweddion arbennig ei hun, wedi eu llunio gan iaith, hanes, traddodiad a gweithgarwch diwyllianol[3]. Cyfeiriwyd[4] at ddatganiad yr IUCN am yr hyn sy'n diffinio ardaloedd gwarchodedig Categori V (sef y categori rhyngwladol y daw Parciau Cenedlaethol gwledydd Prydain oddi tano):

Tir... lle mae cyd-berthynas rhwng pobol a natur dros amser wedi creu ardal o gymeriad arbennig sydd o werth aesthetig, ecolegol a/neu ddiwyllianol arwyddocaol ac sydd, yn aml, â lefel uchel o amrywiaeth fiolegol. Mae diogelu cyfanrwydd y gyd-berthynas hon yn anhepgorol ar gyfer gwarchodaeth, cynhaliaeth a datblygiad ardal o'r fath.[5]

Un o argymhellion yr Adolygiad[6] oedd y dylai'r gyd-berthynas rhwng yr amgylchedd, yr economi a chymunedau lleol fod yn ystyriaeth ganolog yn rheolaeth y tirluniau diwyllianol hyn. Argymhellwyd hefyd y dylai'r Parciau gydweithio mewn partneriaethau gyda chymunedau a grwpiau eraill â diddordeb i'r perwyl hwn.

Yn dilyn Adolygiad 2004 o swyddogaethau'r Parciau Cymreig aeth Awdurdod Parc Cenedlaethol Eryri ati i sefydlu Bwrlwm Eryri yn 2005, oedd yn Fforwm Dreftadaeth Ddiwyllianol o dros 50 o fudiadau a chyrff lleol a sydd bellach, ers 2008, wedi dod o dan adain yr Awdurdod.

Yn ogystal â chynnal ffeiriau treftadaeth llwyddiannus ac ymgymryd â phrosiectau cymunedol a diwylliannol aeth Bwrlwm Eryri ati i greu diffiniad manylach o beth yn union yw treftadaeth ddiwyllianol:

Treftadaeth ddiwyllianol yw etifeddiaeth weladwy ac anweladwy pobl / cymunedau sydd, ar yr un pryd, yn fynegiant o'u hunaniaeth ddiwyllianol a hanesyddol yng nghyd-destun eu perthynas â bro neu ardal.

Gall y diffiniad hwn gwmpasu:

Y dreftadaeth weladwy – sy'n mynegi perthynas pobl â'r tir (hynny yw, elfennau ddaw, i wahanol raddfeydd, dan reolaeth gynllunio a gwarchodaeth

statudol):

- y tirlun hanesyddol, adeiladau a safleoedd
- cynefinoedd ecolegol a bywyd gwyllt

Creiriau, offer a dogfennau – sy'n adlewyrchu hanes, economi, crefft, celf a llenyddiaeth y gymuned (gallant ein galluogi i ddeall a dehongli perthynas y gymuned â'r tir, rŵan ac yn y gorffennol)

Y dreftadaeth anweladwy – sef hanfod diwylliant byw y gymuned ac sydd yn mynegi dealltwriaeth a pherthynas pobl â'r tir a'r amgylchedd o'u cwmpas:

- iaith, dywediadau, chwedlau, creadigrwydd llenyddol a cherddorol, arferion a thraddodiadau.
- doethineb llafar – yn gynnyrch hir brofiad o fro a defnydd tir, all fod yn ffynhonnell amhrisiadwy o wybodaeth i esbonio a chyfoethogi ein dealltwriaeth o ddeinameg y prosesau a grëodd y cynefinoedd a'r dreftadaeth weladwy y ceisiwn eu gwarchod
- sgiliau traddodiadol – y dulliau ymarferol o reoli tir a'r crefftau gwledig amrywiol, e.e. codi waliau, sy'n hanfodol er cadwraeth y tirlun a chynefinoedd (maent yn adnoddau amhrisiadwy ar gyfer deall, gwerthfawrogi a chynnal cefn gwlad yn ymarferol)

O ganlyniad i'r datblygiadau hyn, mae gennym amcan llawer cliriach nag o'r blaen o'r hyn a olygir gan dreftadaeth ddiwylliannol a'r modd y gellir gweithredu yn uniongyrchol i'w hybu.

Nid hon yw'r stori'r gyflawn, o bell ffordd, oherwydd bu sawl corff, mudiad ac unigolyn yn gwneud eu gorau dros ein treftadaeth ddiwylliannol ers llawer blwyddyn, megis Adrannau Llyfrgelloedd a Diwylliant yr Awdurdodau Lleol, yr Academi Gymreig, Cyngor Llyfrau Cymru, Yr Amgueddfa Genedlaethol a llu o gymdeithasau fel Cymdeithas Alawon Gwerin Cymru, Cymdeithas Llafar Gwlad ac ati. Uchod ceisiais olrhain deffroad un gangen o'r mudiad amgylcheddol i'w dyletswydd.

*Mae **Twm Elias** yn ddarlithydd a threfnydd cyrsiau ym Mhlas Tan y Bwlch, Canolfan Astudiaethau Amgylcheddol a Gwasanaethau Addysg.*

(Barn bersonol yr awdur yw'r hyn fynegir yn yr erthygl uchod; nid yw, o anghenraid, yn adlewyrchiad o safbwynt unrhyw Awdurdod swyddogol)

Cyfeiriadau

1. Deddf Parciau Cenedlaethol a Mynediad i Gefn Gwlad 1949
2. Fit for the Future (1992)
3. Adolygiad o Awdurdodau Parciau Cenedlaethol yng Nghymru (2004), Llywodraeth y Cynulliad, Ad. 2.11.
4. Ibid, Ad 2.14.
5. Canllawiau ar Gyfer Rheoli Categoriau Ardaloedd Gwarchodedig, 1994.
6. Adolygiad o Awdurdodau Parciau Cenedlaethol yng Nghymru (2004), Llywodraeth y Cynulliad, Ad 2.15.

Huw Jenkins

The invisible heritage

This article traces how the concept of 'cultural heritage' has been adopted into our National Park purposes. It proposes a definition of cultural heritage and looks at some recent projects which take the concept forward. The aims of the National Parks, as defined in the original National Parks Act (1949) was to "protect and enhance the natural beauty…" (only), and it took until the 1995 Environment Act for the words "…wildlife and cultural heritage…" to be added, taking account of Agenda 21 commitments (Rio Convention, 1992) to sustainability.

A proposed definition of cultural heritage reads as follows: Cultural heritage is the visual and non-visual inheritance of people / communities and is an expression of their current and historic identity in the context of their relationship / sense of belonging to a particular area. This recognises that tradition, oral wisdom and practical skills are essential to understand and maintain the dynamics of what we are trying to protect.

Charis White

Table for one?
Otter foraging in Wales

The Eurasian otter

A study into the diet of otters on Gower and in Pembrokeshire has shed new light on the ecology of otters in Wales. They prove to be opportunistic feeders which often leave freshwater for the sea, but the core of their diet consists of small fish and amphibians. Understanding the relationship between a healthy environment and a healthy otter population, as ***GARETH PARRY*** *explains, will help inform a holistic approach to conservation.*

The Eurasian otter *Lutra lutra* is one of the most charismatic animals in the United Kingdom. Stories such as Henry Williamson's *Tarka the Otter* and Gavin Maxwell's *Ring of Bright Water* evoke images of nature at odds with the modern fast-paced world. The reality is that many of our native mammals have struggled to survive alongside human development. The crash in otter populations goes back to the 1950s when organochlorine pesticides devastated populations in the UK. By the end of the 1970s otter populations had declined to the extent that they only remained at 5% of sites in England and 20% of sites in Wales. Thankfully, since most of these pesticides are now banned, otter populations are on the increase. Otters are recolonizing areas where in many cases prey communities and habitat structure have changed considerably during their absence. However, the otter is showing an extraordinary capability to adapt in order to harness the resources available to it.

Otters in Wales

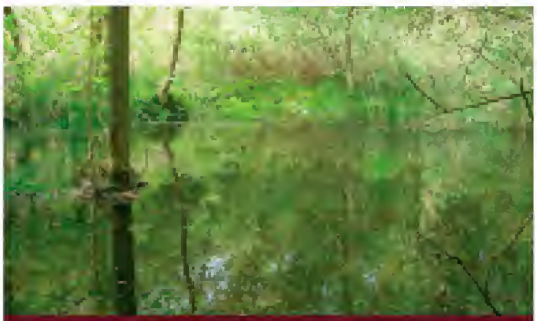
For a long time the importance of Wales for otters in the UK was overlooked. This importance may stem from the nature of the terrain, which makes access difficult, allowing relatively unaltered and undisturbed habitats to act as a stronghold for otters. In Scotland otters

Gareth Parry

Are there otters at the bottom of your garden? Otters regularly use this stretch of the river Clyne on the Eastern border of Gower even though it runs alongside a residential area.

have received a great deal more attention as they are predominantly active during the day, so sightings are more common and scientific study is considerably easier. However, Wales contains many freshwater systems and has a diverse coastline, which provides habitats that are highly suitable for otters. The most recent national survey of Wales found indisputable signs of otters at 71% of the sites visited.

Despite their widespread distribution, very little is known about their ecology and behaviour here. The efforts of a small number of dedicated otter workers have helped uncover some fascinating information regarding the ecology of Welsh otters, but there is still much to learn. The most striking discovery so far is that otters in Wales are making forays into the sea. Although the Eurasian otter is traditionally associated with freshwater systems, marine foraging is not uncommon. In Scotland the otter's use of the marine environment is well documented and in places such as Shetland marine prey dominates diet. Until recently marine foraging in UK otters was thought to be the sole preserve of Scotland, but it is now known that Welsh otters also have maritime tendencies.



Gareth Parry

Ponds provide good foraging

The surprising importance of otter poo

It may seem a little odd but much of what we know about otters has been obtained through studying their faeces, which are better known as spraints. Spraints can be used to confirm the presence of otters, estimate habitat use or even be picked apart to investigate diet. This is actually not as unpleasant as it sounds as otter spraints have a distinctive sweet hay-like aroma, which has even been compared to jasmine. The undigested hard remains, which consist mainly of fish bones, can be identified to give an indication of what the otters are eating. However, some caution is required as although the technique

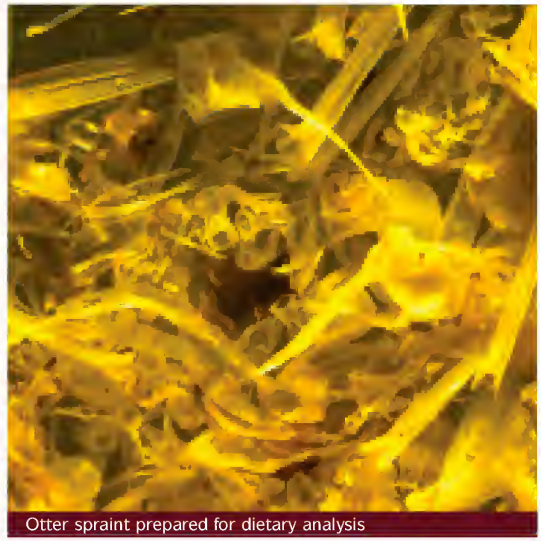
gives a reasonably accurate picture of diet it has some biases associated with it, such as the inability to detect soft-bodied prey.

Spraints also function as a scent mark, making them an integral part of otter society. Olfactory communication is important to all members of the weasel family (Mustelidae), but for the typically solitary otter it is the primary form of communication. Unfortunately, our knowledge pretty much stops there as practically nothing is known about the scent message contained in spraints. It may seem strange, but collecting spraints could be akin to removing post-it notes intended to pass important information on. We've all had frustrating moments of furiously searching for that scrap of paper we had scribbled someone's new number or address on. Well, imagine if someone was going round taking our notes as quickly as we penned them. There is a growing interest among ecologists regarding the ethics associated with field work. It is hard to predict how collecting spraints affects otters, if it does at all, but as we understand so little about scent marking it is better to take a cautious approach. Collection should only be considered when there is the potential to substantially improve our understanding of these remarkable animals.

Otter diet in south west Wales

In an attempt to uncover some of the mysteries surrounding Welsh otters a two-pronged project was undertaken. Otter diet on the Gower Peninsula was investigated as part of a PhD study, which I carried out within the Conservation Ecology Research Team at Swansea University (CERTS). At the same time, in collaboration with the Pembrokeshire Marine SAC (Special Area of Conservation) group, a team of dedicated volunteers was despatched to collect otter spraints from Pembrokeshire coastal sites. In both projects the spraints were collected under licence.

The project obtained some remarkable results, highlighting the naivety in commonly held assumptions regarding otter diet in the UK. It was found that Salmonids were rarely consumed by otters on Gower and Pembrokeshire. Small, easily caught fish such as bullheads and gobies were the preferred dish of the



Gareth Parry

Otter spraint prepared for dietary analysis

day. Eels were frequently predated during the summer, but were rarely taken in winter. The diversity of non-fish prey consumed was astounding, with frogs, toads, newts, dragonfly larvae, seagulls, little egrets, rats and even the odd weasel turning up in the diet.

Otters, the economical diners

Like all animals, otters have to weigh up the profitability of their meals. There is no use expending lots of energy catching one large fish if smaller, more abundant prey would be more profitable in terms of energy. Around Europe it has been found that the majority of fish taken by otters are between 10 cm and 25 cm in length. The results from Pembrokeshire and Gower agree with this, indicating that small fish also dominate otter diet in Wales. However, there is no point in turning down an easy meal and the diversity of otter diet shows that they will take both larger and non-typical prey, should the chance arise. When it comes to food the otter is clearly opportunistic, using the full spectrum of what is available.

Future prospects

Although the distribution of otters in Wales has been spreading, the future of our only truly semi-aquatic carnivore is by no means secure. There are several threats to otters including habitat destruction and pollution. These dietary studies have shown that a

number of the most important prey species for otters in Wales are threatened themselves. Eel populations around Europe have fallen drastically in the last few decades with some studies reporting declines of over 90%. Bullheads are another important prey species under threat, with a range of pressures including pollution, gravel extraction, silting and predation by the introduced signal crayfish. The global predicament of amphibians is well documented with just under one-third of the species thought to be threatened. In Wales, as in many areas of the UK and Europe, amphibians are an important prey group for otters, particularly during winter and spring when food can be hard to come by.

Otters live in a habitat which is full of uncertainties and their food supply is by no means stable. They are adaptable animals and will no doubt respond to future changes with remarkable tenacity, as they have done in the past. However, there could come a point when many areas do not contain sufficient prey or habitat resources to support an otter population. To successfully conserve otter populations we need to understand how they interact with their environment and appreciate the limitations of our knowledge. This is why we need to adopt a holistic approach to conservation, continuing to protect the precious wetland habitats and rich coastlines of Wales. This will ensure a future for much of our wildlife, not least the otter.

***Gareth Parry** is a PhD student in the Conservation Ecology Research Team at Swansea University (CERTS).*

Gareth Parry

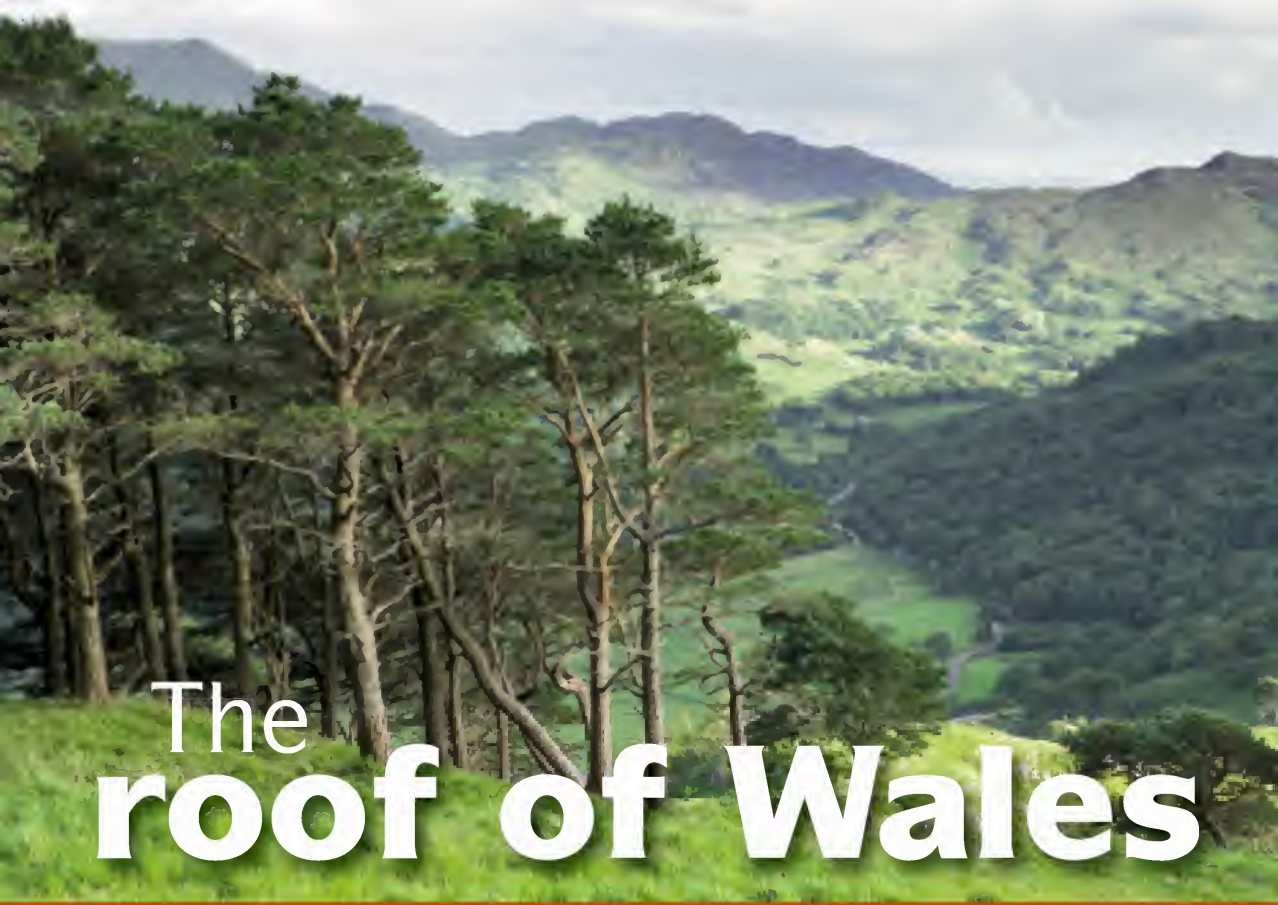
Otter habitats can be unpredictable. The small streams on Gower dry up quickly when there is no rainfall.

Charis White

Addasu a llwyddo – ond am ba hyd?

Plaladdwyr organoclorin roddodd glec i niferoedd dyfrgwn yn y 1950au. Bellach mae dyfrgwn ar gynydd eto ac yn dangos cryn allu i addasu i gynefinoedd sydd wedi newid dipyn yn ystod eu habsenoldeb. Mae Cymru, gyda'i hafonydd niferus a'i harfordir amrywiol, yn gadarnle pwysig i ddyfrgwn. Gwyddom bellach eu bod yn defnyddio'r môr yn ogystal â dŵr croyw yng Nghymru. Drwy astudio'u baw, dysgwyd yn ddiweddar bod dyfrgwn Sir Benfro a Bro Gŵyr yn fwy hoff o fwyta pysgod bach fel y penlletwad a'r gobi nag eogiaid a brithyll. Mae llyswennod yn bwysig yn yr haf ond nid yn y gaeaf a madfallod dŵr yn bwysicach yn y gaeaf a'r gwanwyn pan fydd bwyd arall yn brin. Mae'n llai o waith iddyn nhw ddal prae bychan ond fe gymerant greaduriaid mwy hefyd, fel llygod ffrengig a gwylanod, os bydd cyfle.

Mae llygredd a diflaniad cynefinoedd yn dal i beryglu dyfrgwn. Mae'r rhai o'r creaduriaid sy'n fwyd iddyn nhw, fel y llyswennod, y madfallod dŵr a'r penlletwad, dan fygythiad hefyd. Er gwaethaf gallu dyfrgwn i addasu i amgylchiadau newydd, mae'n bosib y gwelwn ddydd pan na fydd digon o fwyd nac adnoddau eraill ar gael i'r creaduriaid hyn.



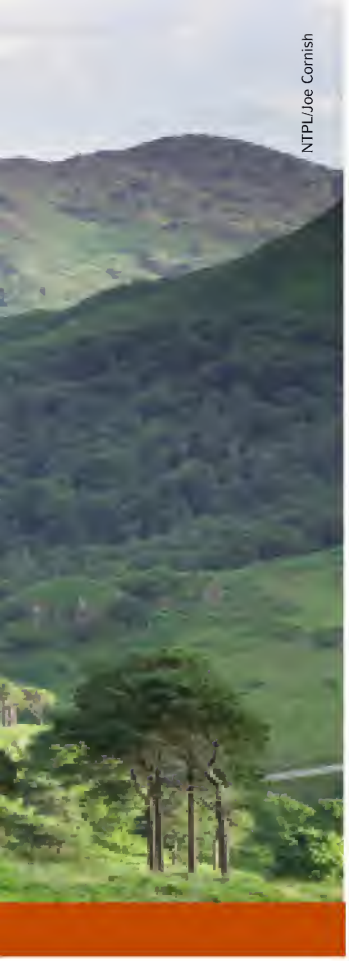
The roof of Wales

Hafod Y Llan

Mountains give Wales its backbone and character. The National Trust has a stake in many of these, both as a landowner and a conservation organisation keen to resolve the pressures which have damaged the uplands and to bring them into good heart. ***HELEN BUCKINGHAM*** *and* ***DAVID BULLOCK*** *describe some of the ways in which the National Trust is striving to improve the ecological health of this unique upland heritage.*

Of all the habitats, landscapes and buildings owned by the National Trust in Wales, none is more inspirational than its mountains. From Sugar Loaf in the Brecon Beacons to the Eryri massif, they rejuvenate us, provide us with clean air and water, and their soils are a massive carbon bank. Rockier than the picturesque Lake District fells, with high crags and lots of 'fog and bog', climbing them is as much a wild as a romantic experience. It is still possible to walk for whole days in the Cambrian Mountains and not encounter anyone. Even in the remotest places, the character of the Welsh uplands is in part defined by the many human pasts which have left their mark, from the derelict Hafotai high up in the hills of Dolmelynllyn to the copper mines of Hafod y Llan. These are a reminder that the upland landscapes are in reality a restless mingling of history and nature.

Traditional connections between uplands and lowlands remain. Farmers no longer use the *hafod a hendre* system, where livestock spent the summer in the mountains and the winter at the lowland farm, but the place memory of transhumance is strong. The miners and quarrymen have largely gone, but the mineral-worked mountain sides will be with us for centuries yet. Cynefin, a word about sense of belonging that continues to defy translation into

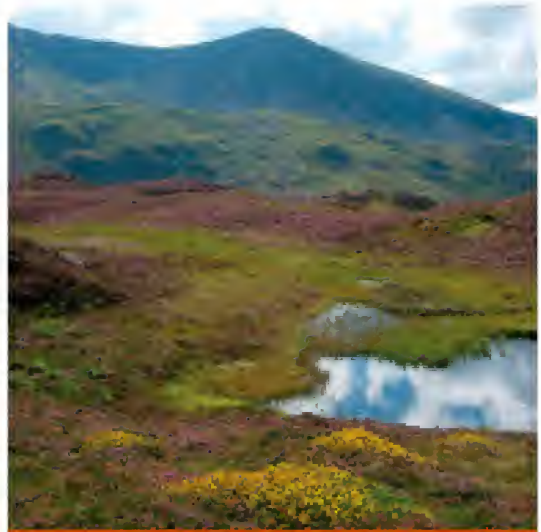


NTPL/Joe Cornish

English, has a huge resonance with people living in the Welsh uplands.

The continuum of upland to lowland would have been much more apparent in the Atlantic period, between 7,000 and 5,000 years ago, when the footprint of hunter-gathering Mesolithic people was light. This was the time of the greatest extent of the wildwood, but the landscape would not have been cloaked in woodland: the uplands may have had, at best, a sparse and shifting scrub and tree cover. Such was the habitat destruction and hunting pressure of Neolithic and subsequent farming cultures that much of the spectacular wildlife (amongst the mammals alone beaver, lynx, wolf, brown bear and wild boar) became extinct in Britain. Persecution in historical times did for the eagles and some other raptors, and the smaller carnivores such as pine marten and polecat were, in population terms, brought to their knees. One, the wild ox or aurochs, is globally extinct.

All these species used to occur in Wales and, to some extent at least, used the uplands. Beaver and aurochs were keystone species, with profound influences on the functioning of wetland and terrestrial ecosystems respectively. So, compared with wildwood times, the uplands of Wales now have an impoverished fauna and flora. It is from this baseline that the National Trust, along with other major landowners, has a pivotal role in ecological restoration and the development of sustainable land use systems. There is great potential to restore the uplands' wonderful wildlife and nurture



Helen Buckingham

Bryn Rhug, Cadair Idris

their natural resources, refreshing the connections between people and nature and introducing some challenges for the future.

The present state of our uplands

In Wales, the Trust owns over 49,000ha of land, about 60% of which is above 240m altitude. It is mostly on acid soils, and has a cool and wet climate with up to 4000mm of rainfall per year. It includes some of the most impressive glaciated landscapes in the UK, and also large tracts of remote, desolate land which hold deep deposits of peat.

Some of our uplands are in a fine ecological state (for example, Bryn Rhug on Cadair Idris) but most have suffered from adverse impacts such as inappropriate grazing, burning and drainage, non-native invasive species, and pollution and vehicle damage.

Nature's capital

The nature conservation interest of our upland holding in Wales is immense, with 20,350ha designated as nationally important, of which 14,860ha is internationally important (7,440ha of this are SPAs).

A recently published National Trust document, *Nature's Capital*, reviews the importance of the uplands, and describes how the uplands provide the

nation with a range of environmental services. More and more people use the mountains for walking, rock climbing and as a place to escape the busy world of everyday lives: they are a playground, a refuge for wildlife and a living library of cultural history.

But these uplands are also vital for ecosystem services, especially providing clean water and protection from flooding, and are also a carbon store and sink. These vital services are not yet properly valued or provided for. The current markets in water and carbon are inadequate and do not invest in these assets, though there are opportunities to remedy this. Agri-environment funding can play a part, but it is no panacea.

The Trust is therefore calling for new sources of investment in land management. There is great potential for creative measures to pay farmers and land managers for providing these environmental services, in the uplands particularly. Water company investment in land management to improve water quality at source would reduce the need for expensive treatment downstream. Land managers could also receive a greater share of the flood risk management budget in return for management that makes space for water and reduces flood risk. Carbon markets have potential to bring private sector investment to land-based carbon storage. Such measures also have other benefits, including boosts to biodiversity and an enhanced landscape, and are often cheaper than end-of-pipe solutions.

Climate change

The mountains of Wales are likely to be profoundly affected by climate change. With fewer frosty days and longer growing seasons, dwarf shrub-dominated communities may become grassy, and bracken and *Rhododendron* are marching uphill. In Wales many upland habitats and species are at the southern edge of their geographical range. There is a real risk that high elevation communities (such as montane heath on the Carneddau, and the chasmophytic arctic-alpine vegetation in Cwm Idwal) will be severely modified by the end of this century. In the Brecon Beacons we may lose the purple saxifrage. But we are more likely to lose features where they are already in a poor condition. It is vital to build up ecological resilience, by reducing negative impacts and using a strategic approach to help decide where habitats could be. Climate change specialists talk of increasing uncertainty and 'the only security is insecurity', which gives us every reason to aspire to get habitats into a good condition whilst accepting that they could change.

If we focus only on the condition of designated sites, we are in danger of neglecting the immense potential of our uplands and those who live and work there. Over 80% of the Trust's land in Wales is farmed. Our tenants should be our partners in land management in which we jointly identify and nurture what is most valuable from one generation to the next. In some cases, farming sheep and cattle may play second fiddle to farming for carbon and water and providing recreational opportunities. We have also considered how far we can let some of our uplands go in terms of wildness, where the meat and fibre are no longer important and a wild experience, possibly with free ranging large herbivores, is what is on offer – a nod to the wildwood.

NTPL/Joe Cornish

Welsh Black cattle at Hafod Y Llan

Helen Buckingham

Glacial hanging valley at Cwm Idwal

Current projects

The Trust has some hard decisions to make about what it wants from the vast tracts of uplands. The debate started a decade ago when we acquired, with substantial public support, Hafod y Llan, a hill farm on the southern flanks of Snowdon which also took in the northern slopes of Cnicht. The main block of the farm covers some 1,025ha extending from the river and Atlantic oak woodland of the Nant Gwynant valley, through upland heath and grassland and rock habitats, to the summit of the mountain. Most of the farm is within the Eryri SAC and part of it is in the Snowdon NNR.

It was decided to maintain the estate as a working farm, demonstrating habitat restoration and conservation, and good farming practice. With support from CCW, the sheep flock was drastically reduced and we built up a herd of hardy Welsh Black cattle. These beasts graze some of the highest pastures on the mountain, playing a key role in restoring the diversity of the upland heath and grasslands.

Cwm Idwal - At about the same time the Trust took the brave step, with the support and guidance of CCW, of buying out the tenant and excluding stock from Cwm Idwal, an iconic glacial hanging valley and north-facing cirque of some 400ha. It was designated in 1951 for, amongst other features, its arctic-alpine chasmophytic vegetation (including Snowdon lily and purple saxifrage), tall herb ledge communities, and dramatic glaciated landform. The vision for the site includes an aspiration for naturalness and a celebration of natural processes, in which the influence of non-native species is minimal. But Cwm Idwal, Wales' first NNR, was declining in quality because of overgrazing by sheep.

Grazing pressure increased throughout the latter part of the 20th century and, in 1997, an agreement was reached between the Trust, our tenant farmer and CCW, to remove sheep from the area. Ten years on, despite an increasing number of feral goats, the benefits of removing sheep and continually shepherding stray sheep away are very visible. Where short cropped grass swards used to dominate, a mix of heath species is developing; the flushes now have a fine display of flowering bog asphodel and cotton grasses, and on the ledges cushions of saxifrages and other palatable species are beginning to recover.

Upper Conwy - More recently we have been investing in the Upper Conwy Catchment Management Project on the Ysbyty Estate. Through an integrated approach to land management, this seeks to improve both the quality of one of Wales' most important blanket bogs, on the Migneint (part of the Migneint Arenig Dduallt SAC and SPA), and the water in the catchment. We are working with our tenants to block ditches to raise water levels, thereby improving the quality of the blanket bog and increasing the area of peat forming *Sphagnum*. We want to maximise the potential of the Migneint as a carbon store and sink. Rewetting the blanket bog and, with time, slowing down the rate of carbon loss, will make the Migneint's vegetation and underlying peat more resilient to climate change.

Abergwesyn - Another important project is being developed at Abergwesyn, in the heart of the Cambrian mountains. Acquired in 1984, this 6,700ha of upland common is one of the largest blocks of land owned by the National Trust. There are extensive areas of degraded dry heath and blanket bog and it is part of an internationally important upland bird breeding habitat (Elenydd-Mallaen SAC and SPA). The vast area of deep peat is an important carbon store, and part of a major water catchment. Abergwesyn is a 'wild' place, and we want to keep it that way, but it has been used by people for millennia and is still a

farmed landscape with over 100 commoners. Working with the commoners will be vital if we are to restore some of the degraded habitats, conserve the historic environment, and reduce carbon emissions from the blanket bog and other peaty soils.

Gelli Iago - A wilder experience for beast and man? The lightest tread on the mountain? A block of land full of huge rocks, tall heather, tightly grazed acid grasslands, and wet heaths and flats with purple moor grass, sweeps down from Cnicht to the Blaen Nanmor valley, known as Gelli Iago, part of the Hafod y Llan estate. For this area of nearly 500ha, we have developed a vision for habitat management at the landscape scale, where nature is much more in charge than would normally be the case. In this degraded area of upland we want naturalness to take centre stage. Our hardy Welsh Black cattle will play an essential role and a new herd is being created which will spend most, if not all, of the year ranging across Gelli Iago. These 'free-range' but carefully husbanded cattle will select for themselves which habitats they use and when they use them, in a sense emulating the impacts of the large herbivores that once roamed these uplands. 'Slow grown' meat or hardy store cattle will become available over time but they will not be the primary product. We hope to be able to demonstrate that this low-input 'naturalistic' system, whilst not necessarily profitable in terms of meat and animals, can show added value as part of a wild experience. It could become a model for other farmers of marginal land and is being adopted in two other areas of Trust land in England.

We are fortunate enough to have a reference point for some of the rich habitat we hope to see here, in

Hafod Y Llan

NTPL/Joe Cornish

the Trust-owned area of Hafod Lwyfog to the north. Here, where grazing has been very limited for many years, there is a rich and diverse heath with scattered scrub and tree regeneration.

The wider view

These are just a few examples of our larger projects, but across Wales there are some increasingly difficult decisions to be made about what we want from our uplands. We need to address the condition of our designated sites in a wider context – often this links in well to addressing issues of carbon stores, climate change and water quality. The condition of our designated sites is crucial but we also need to develop large scale connections/ecological corridors and networks to ensure that our uplands are robust and healthy.

For the Trust these issues also have to be addressed in the face of constraints. Even if we know where we want to be it is not that simple, as virtually all of our holding is in full agricultural tenancies or is common land. There is no magic wand to hand and we have to work with land managers and communities to achieve our ideals.

Other pressures

There are other pressures too. Non-native and native invasive species are likely to be increasingly evident in the Welsh uplands, thanks to climate change. Society may not sanction eradication of

Rhododendron from Snowdonia – it would cost tens of millions of pounds and may incur politically sensitive protests – but there are certainly some areas where its control is a priority and we welcome the recent lead by the Snowdonia National Park Authority to develop a strategic approach to its management.

Sheep and goats were introduced to Britain by Neolithic peoples, so they too are 'non-native'. Sheep are relatively easy to manage: feral goats, for a variety of reasons, are not. A series of mild winters has resulted in a doubling of the number of goats in Snowdonia in less than a decade. There are few people who would wish to see the feral goat eradicated, but a majority would accept that they should be controlled where they are making a nuisance of themselves (breaking down walls, marauding in gardens, damaging heathlands, inhibiting regeneration in woodlands, competing with sheep for food and causing road accidents all spring to mind).

But compared with the issues surrounding wild large herbivores in England and Scotland, Wales has had little to worry about. Until recently there were very few populations of deer (and then mostly the non-native fallow with a few muntjac). The two native species, roe and red, have recolonised and been reintroduced respectively. In England, all five species of deer are increasing in range and abundance, and we can expect at least four of them do the same in Wales. Like feral goats, deer do not respect stock fencing, and like goats they are costly to manage.

The challenge

What do we do when roe and red deer re-establish over the Welsh uplands? We know from a plethora of studies from the rest of Britain that deer management can divert resources away from land-use projects, but at the same time should not Wales welcome the return of these elegant, beautiful and integral elements of its woodlands and uplands? Building on (hopefully successful) sustained management of the feral goats, people whose lives are dependent upon the uplands in Wales need to have this debate.

Ultimately we want the Welsh uplands to realise their true environmental potential – large areas of rich wildlife habitats that speak to us about their physical origins as much as their past and present land use. And more than ever, we need to prepare for an uncertain future.

Helen Buckingham *is Nature Conservation Adviser for National Trust Wales;* ***David Bullock*** *is Head of Nature Conservation at the National Trust.*

Mynydd o her

Mae'r Ymddiriedolaeth Genedlaethol (YG) eisiau gwella cyflwr y rhan fwyaf o'r ucheldir sydd yn ei meddiant. Mae 20,350ha o hwn yn genedlaethol bwysig o safbwynt bywyd gwyllt a daeareg. Mae ucheldiroedd hefyd yn fannau chwarae, yn drysorfeydd diwylliannol ac yn cynnig gwasanaethau hanfodol i gymdeithas, fel rheoli dŵr a storio carbon.

Drwy dalu rheolwyr tir i ddarparu'r gwasanaethau hanfodol hyn yn yr ucheldir gellid arbed costau uwch, fel trin dŵr a gwarchod rhag llifogydd, yn is i lawr y dyffrynnoedd. Rhaid gwella cyflwr ucheldir er mwyn lliniaru a helpu bywyd gwyllt i ymdopi ag effeithiau anorfod newid hinsawdd, fel lledaeniad rhedyn ungoes a diflaniad llystyfiant bregus y copaon.

Mae angen gweithio tu hwnt i safleoedd dynodedig i greu rhwydweithiau ecolegol a thirluniau mwy gwydn. Rhaid cydweithio hefyd â thenantiaid sy'n ffermio dros 80% o dir yr YG yng Nghymru er mwyn cyd-adnabod a gwarchod yr hyn sy'n bwysig o un genhedlaeth i'r nesa'. Mae cwestiynau dyrys i'w hateb. I ba raddau dylid gadael i diroedd droi'n 'wyllt'? I ba raddau dylid rheoli planhigion ac anifeiliaid ymledol fel rhododendron, geifr a cheirw? Mae prosiectau diddorol eisoes yn digwydd; gwella cyflwr corsdir ac ansawdd dŵr ar 'stad Ysbyty Ifan, atal pori yng Nghwm Idwal a gadael gwartheg duon Gelli Iago i grwydro'n rhydd ar y mynydd drwy'r flwyddyn, gan adleisio effeithiau'r creaduriaid pori hynafol a chreu naws mwy 'naturiol' ar draws tirlun eang.

Mae digon i'w ddysgu, llawer i'w drafod a phenderfyniadau anodd i'w gwneud yn wyneb dyfodol ansicr i'n hucheldiroedd.

On the track of **scarce bats in Wales**

Some bats are hardly ever recorded because they are so rare; yet other bats may be escaping detection because they are elusive rather than rare. Untangling the rarity versus elusiveness conundrum takes systematic surveys, helped by some clever technology.
***ROB STRACHAN** updates the scarce bat picture emerging from the endeavours of bat workers throughout Wales.*

VWT

Lesser horseshoe bat

Telling one bat from another as it flitters about in the twilight has always been fraught with difficulty. It is difficult to judge its size and get a good look at its jizz (the way it moves, the shape of its wings and relative size of its ears). That small bat beating up and down a tree line at dusk may well be common pipistrelle or a soprano pipistrelle as they are both widespread and common, but it might be one of the less common ones, perhaps whiskered or Brandt's, or maybe a lesser horseshoe or could it be a Nathusius' pipistrelle? And what's that big bat that has suddenly appeared? It must be a noctule or may be a serotine or was it a greater horseshoe?

It is not surprising then that our knowledge of the distribution of scarcer bat species has been pretty poor to date. So just how common are barbastelles, Bechstein's, lesser and greater horseshoes, Leisler's, serotines and Nathusius' pipistrelles? Where have they been recorded to date and where are our gaps in knowledge?

A review of information about scarce bats gleaned by bat workers across Wales also gives an opportunity to examine the various methods used to detect and confirm their presence. Data was drawn from roost visits, hibernacula checks, bat box schemes, bat detector surveys, mist netting and harp trapping and a small number of radio-tracking studies. For each of the scarce species I have made a suggestion as to which methods gives the best results and so should be included in the survey tool-kit for bat workers.

Tracking down bat roosts in summer and winter

Many of the commoner species are readily encountered at their summer breeding sites, particularly if they live close to people by taking up residency in a roof void or cavity wall of a house, or

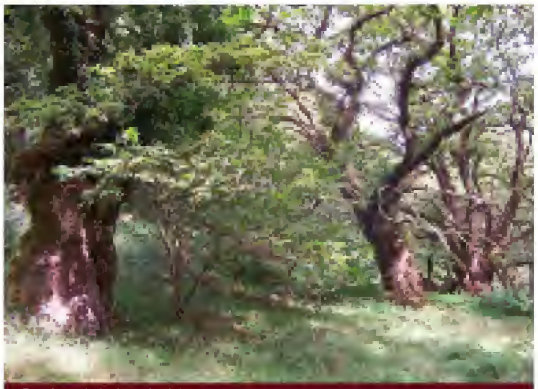
Rob Strachan

Shwegler bat box

maybe in an outbuilding, barn or church. The bats' comings and goings at dusk and dawn are then more likely to be spotted and reported to the local bat group. A visit by a licensed bat worker should be able to determine which species are present, as animals may be seen close up or taken by a hand net to check the identity of any cryptic species (such as sorting out the different species of pipistrelle or distinguishing a whiskered from a Brandt's).

As bats emerge at dusk we might hear some pre-emergence chatter or notice a flight line that can be followed back to the roost. For the really keen bat worker the flight lines can be followed again at dawn, and this way summer roosts can be found in buildings, bridges, other structures and trees.

Once a roost is discovered it can be monitored by daytime surveys and evening emergence counts. For example, the lesser horseshoe bat is extensively monitored by counting numbers as they emerge at



Rob Strachan

Bechstein's bat habitat

dusk from known roosts across Wales. A very comprehensive monitoring programme managed by CCW includes 128 breeding sites that are counted annually to assess trends in the species status.

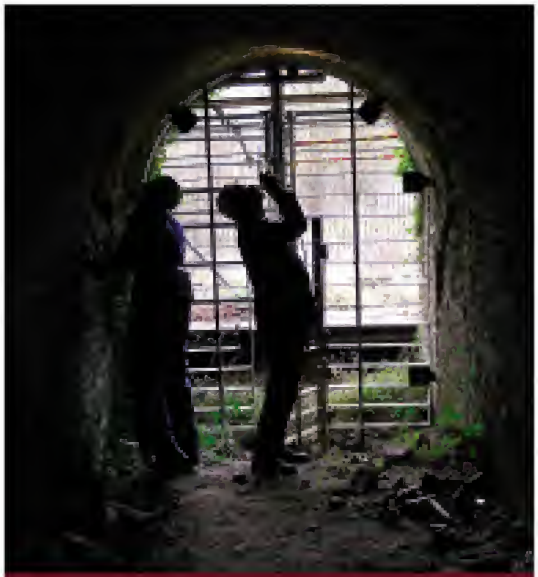
In the winter, the lesser horseshoe departs to underground hibernation sites in mine adits, tunnels and cave systems. Searches of such sites by licensed bat workers allow the species to be monitored by counting sleeping animals. Occasionally these winter site searches can reveal some of the scarcer bat species such as a greater horseshoe in the Conwy valley in 2006, north of its normal range. Another unexpected find was a single serotine hibernating in a crevice in Cefn Caves, Denbighshire in January 2008. This was the first time this predominantly southern species had been found in the winter in Wales.

Finding bat roosts is a profitable way to describe the distribution of many species. However, rare and elusive species, by their very nature, do get overlooked and only a handful of roosts are known. For some species we have yet to find the first one!

Bat boxes

Another way to bring the bats to you and allow you to see them close up is to erect bat boxes in woodlands. Each box provides a cavity that is accessed via a slit or crevice designed to exclude birds. The bats may arrive within days of a box being put up but it may also take years to find. The boxes are best used as part of a scheme with 30 or 50 erected throughout a wood. Pipistrelles, brown

Rob Strachan



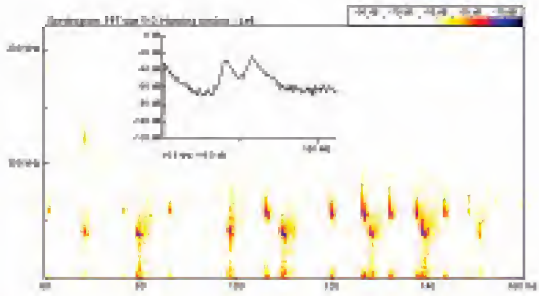
Searching for bats

long-eareds, noctules, Leisler's, Natterer's, Daubenton's, Brandt's, whiskered, Bechstein's and barbastelles have all used boxes in Britain. The latter two are rare woodland dwellers that are easily overlooked at natural tree holes, cracks in branches or even under flaking bark. The design of the box may influence which species are encountered and the use of Schwegler 1FF flat boxes has been found to be particularly good for barbastelles elsewhere in the UK, as they mimic a crevice under loose bark. In Wales the Vincent Wildlife Trust has three trial areas using sets of 50 boxes over a three-year period, but no barbastelles have been found yet.

The 'Frank Greenaway barbastelle crevice-box' is a specially designed box that provides a tight squeeze, as if a tree trunk has split, that the Barbastelle really likes. Some of these have also been erected and we are eagerly waiting for the bats to find them.

Bat detector surveys

Recent advances in the study of bats have been made possible with the development of a whole range of portable bat detector devices that listen in on the echo-location calls that each bat makes. The sensitive microphone of the detector picks up the ultra-sound calls emitted and transforms them to ones within the frequency range of the human ear. With practice it is possible to listen to the pattern, repetition rate and tuned frequency range of a real-time bat call and identify the bat species. If the detector is then linked to a recording device such as a MiniDisc or MP3, the call can be captured and played back on computer software for a more detailed analysis.



Pipistrelle sonographs

Some of the more expensive yet sophisticated bat detectors have an in-built recorder or memory card for instant recording. Sound files are usually time and date stamped and in some cases linked to a GPS (Global Positioning System) to tell you where you were. In the latter case, the provision of a GPS allows for surveys to be conducted by car. Here each encounter with a bat on the driven route can be plotted on a map and the species identified using the Sound Analysis software. By covering lots of transects, scarce bats are soon encountered. A good example of this method has been the car survey routes driven in North Ceredigion as part of the Bat Conservation Trust's *Bats & Roadside Mammals Survey*, where the previously unrecorded Leisler's bat has produced records in 2006 and 2007.

Putting a lot of people with detectors in one place at the same time can also produce rare bat records. At the Welsh Bat Conference held in Aberystwyth in June 2008, some 116 bat workers were sent out with detectors on the Saturday night. Among the more usual suspects were five recordings of Nathusius' pipistelles.

The Great Pembrokeshire Bat Hunt 2001-02

Supported by the Species Challenge Fund and hosted by the Pembrokeshire Bat Group, a county-wide bat detector survey was conducted over 2001-02.

Henry Schofield/WWT

Single greater horseshoe bat amongst lesser horseshoes

Tranquility bat detectors and MiniDisc recorder kits were supplied to volunteers who were then sent to recording points (such as bridges or road junctions) at 15 or more selected 1km squares within each 5x5km square. Recordings started 30mins after sunset and each point was recorded for five minutes, with habitat data also collected for each point.

In total, recordings were made at 1,385 points (over 80% of the 1km squares in Pembrokeshire) and at least one bat was encountered at 1,034 points (74.5%). Top of the charts were common pipistrelles at 678 points, with soprano pips second at 654 points and noctules at 122 points coming in third. Among the rarer bats were greater horseshoes, barbastelles and Nathusius' pips at fewer than 6 points

The Snowdonia SCF Bat Project 2006-09

Equally ambitious is a survey currently underway in Snowdonia to ensure that bats are well recorded for the Snowdonia Mammal Atlas due to be published in 2010. Here some 117 5x5km squares, each with two or three pre-selected 1km survey transects, are being walked by volunteers kitted out with Duet bat detectors and MP3 recorders. The volunteers can also take part in a series of workshops on Bat Sound Analysis to identify the calls. As many of the transects are paths through woodland, the project has found many new sites for the woodland dwellers such as Natterer's, Brandt's and brown long-eared bats. Common pipistrelle, soprano pipistrelle, whiskered, Daubenton's, noctule and lesser horseshoe appear to be widespread and frequently encountered. The detector surveys have also revealed new sites for greater horseshoe, serotine, Leisler's and barbastelle in Snowdonia. More records should follow as the project goes into its final year. The elusive Nathusius' pipistrelle is still out there somewhere, I'm sure.

Targeted surveys for the rare or elusive

All bats can be elusive at times since they are highly mobile and may frequently move between sites. Summer sites may be some distance away from winter sites and there may be a number of transitional sites used in Spring or Autumn. Some species exhibit 'leking' behaviour (known as swarming) within woodland glades or cave and mine entrances.

For a comprehensive understanding of where rare or elusive bats occur, it is recommended that surveys are carried out targeted on single species. For instance, the greater horseshoe will use a number of caves, mines and barns within its home range. A passive recording bat detector (such as an Anabat) left in such sites will pick up the species' presence sooner or later. Individual greater horseshoes have been recorded this way in Gwynedd, Snowdonia and North Ceredigion.

Radio tracking studies of both barbastelle and Bechstein's bat have allowed predictive models to be developed based on the preferred type of woodland that they inhabit. The barbastelle predictive model

suggests that the species is best looked for in unmanaged and ancient woodland dominated by mature oak or beech. These old trees will provide potential roost sites among loose bark, cracks and crevices. The presence of water features such as rivers and streams within the woodland also seems important. The Bechstein's predictive model suggests that this species is best looked for in woods larger than 25 ha with 75% canopy cover. Oak should be the dominant species and at least 50% understorey cover should be of mature species such as holly. The sites should also be at low altitude (< 120m above sea level).

Testing the models on the ground is currently underway, with focussed survey effort in Pembrokeshire and Carmarthenshire being carried out in 2008-09 by Matt Zeale, a researcher at Bristol University. Matt will use Anabat detector surveys, mist netting and harp trapping to catch barbastelles. Any caught individuals will be fitted with tiny radio transmitters and tracked to locate maternity colonies.

The predictive model for the Bechstein's bat is being investigated in a survey of selected woodlands in Snowdonia, Pembrokeshire, Carmarthenshire and West Glamorgan using harp trapping in association with an acoustic lure developed by David Hills and Frank Greenaway. The lure unit plays synthesised social calls of the Bechstein's, barbastelle, Nathisius' pipistrelle, Natterer's and a pipistrelle-myotis medley. All very high tech, but none of the rarer bats have yet revealed themselves to the diligent bat workers in the wee hours of the night. The truth is out there – we just have to keep looking!

Acknowledgements

I am grateful for the useful comments and data provided by Geoff Billington, Margaret Clarke, Richard Crompton, Erica Dickson, Sam Dyer, Richard Green, Frank Greenaway, Chris Hall, Annie & Bob Haycock, Steve Lucas, Jean Matthews, Tom McOwat, John Messenger, Ian Rabjohns, Jon Russ, Henry Schofield, Peter Smith, Kate Williamson and Matt Zeale.

Frank Greenaway/WWT

Bechstein's bat

***Rob Strachan** is Biodiversity Officer, Environment Agency Wales*

Dysgu am yr Ystlumod Prin

Mae sawl ffordd o ganfod a chofnodi ystlumod, ac mae'r technegau'n dod yn fwy soffistigedig drwy'r amser. Yn yr haf gwelir llawer o'r ystlumod mwy cyffredin o gwmpas clwydfannau magu, fel toeau, ysguboriau ac eglwysi. Yn y gaeaf, bydd nifer yn gaeafgysgu mewn twnelau ac ogofâu. Weithiau bydd rhywogaeth brin yn eu plith - fel yr ystlum adain-lydan a gofnodwyd yn Sir Ddinbych eleni; y tro cyntaf i'r rhywogaeth ddeheuol hon gael ei chofnodi yng Nghymru. Gall blychau ddenu rhai ystlumod prin, fel ystlum Bechstein a'r ystlum du, sy'n hoffi llechu dan risgl ac mewn holltau canghennau.

Mae teclynnau datgelu sain yn gymorth i gofnodi. Gall y rhai gorau gofnodi'r sain a chysylltu gyda GPS fel y gellir nodi union leoliad ystlumod wrth ddilyn traswlinau. Fel hyn y canfuwyd ystlum Leisler yng Ngheredigion am y tro cyntaf yn 2006-7. Ac yn Eryri, gwyddwn nawr am nifer o goedwigoedd newydd ar gyfer ystlumod Natterer, Brandt a hirglust, yn ogystal â safleoedd newydd ar gyfer ystlumod pedol mwyaf, ystlumod adain-lydan, ystlum Leisler a'r ystlum du.

Datblygwyd modelau yn ddiweddar i ragfynegi hoff gynefinoedd coediog ystlumod Bechstein ac ystlumod du, yn seiliedig ar wybodaeth a gasglwyd wrth dracio'u symudiadau. Mae'r modelau'n awgrymu bod ystlumod du yn ffafrio hen goedwigoedd trwchus gyda digon o dderi neu ffawydd aeddfed, clwydfannau addas yn y pren a'r rhisgl a hefyd rhywfaint o ddŵr agored o fewn y coetir. Mae ystlumod Bechstein yn fwy tebygol o fod mewn coedwigoedd dros 25 ha o faint ar lawr gwlad lle mae 75% o'r arwynebedd yn goed deri, yn bennaf, â haen o lwyni aeddfed fel celyn oddi tanodd. Mae prawf yn cael ei roi ar y modelau ar hyn o bryd yn Sir Benfro, Sir Gaerfyrddin, Eryri a gorllewin Morgannwg.

Adapting Welsh woodlands
for the future climate

We see trees and woodlands each day, in rural landscapes and in our towns and cities. They form a very familiar component of our surroundings, and provide a subtle back-drop heralding the change of seasons, particularly apparent on a clear autumnal day at the end of October, when this article was being written. ***DUNCAN RAY*** *and* ***RICHARD CARRICK*** *consider the impacts of climate change on Welsh woodlands, and assess how woodland management must adapt to maintain their resilience and value to society.*

We all appreciate that trees are long-lived plants. However, most of us don't quite grasp the length of the timescales involved. The familiar species of broadleaved tree, such as oak, ash and sycamore found as street trees in towns, and in woodlands within towns and the countryside, may live for several centuries. Those present today may have been planted before the combustion engine was invented and cars passed through the landscape.

Over the last 20 years the role that woodlands play for communities and for society in general has been more fully appreciated by the National Assembly, policy makers, local authorities, and the public. We have more leisure time than our parents and grandparents, but we also have very busy lives, so our time and the natural environment are precious, and of great restorative value. As a result, more people are using woodlands to enjoy nature and appreciate trees. Recent statistics (Forestry Commission, 2007) show that 77% of people have recently visited woodlands, and during the summer months nearly half of those people made regular visits at a frequency of once a month or more.

Woodland is also a major habitat for wildlife in Wales, but many species have declined over recent centuries due to agricultural intensification,

disturbance, and loss of habitat. Forestry Commission Wales is committed to managing the Assembly woodlands, and to encouraging private woodland owners to manage woodlands and forests sympathetically, with a duty of care to the many species that depend on the wide variety of habitats that occur.

The cycle of planting trees, felling the timber for wood products and replacing the trees is an excellent means of producing utilisable products for our economy whilst also helping to limit climate change. Sustainably managed woodlands such those managed managed by the Forestry Commission for the Assembly, are accredited by the United Kingdom Woodland Assurance Standard (UKWAS). This guarantees that Assembly woodlands are managed so that they provide an important resource for our generation without compromising the needs of future generations. The Better Woods for Wales (BWW) grant scheme, introduced in 2006, is designed to meet the needs of the UK Forestry Standard, and in doing so is likely to be accredited under UKWAS.

Climate change

So what has climate change to do with adapting woodlands? From computer models that describe the ways in which the atmosphere and oceans interact, and how the increased concentration of carbon dioxide (and other greenhouse gases) modifies the system, climate scientists are able to consider likely changes in our climate throughout the 21st century. Over the last century or so the global economy has increased the concentration of carbon dioxide gas in the atmosphere to a level greater than at any time over the last 450,000 years. These conclusions come from studies that have measured molecules of air trapped in ice from deep layers in the ice sheets of Greenland and the Antarctic. Carbon dioxide in the Earth's atmosphere acts like a blanket, preventing heat being lost into space, and so climate change models project that the Earth's climate will change as a result, becoming generally warmer.

Meteorological records show that the climate of Wales has changed in a way consistent with climate predictions. Table 1 shows a significant warming of the climate of Wales over the 45 years between 1961-2006, and a trend of wetter autumn and winter seasons.

Table 1 Climate trends of Wales from 1961 to 2006 - Jenkins et al. (2007) Met. Office Hadley Centre and UKCIP.

	Spring	Summer	Autumn	Winter	Annual
Daily mean temperature change (degree C)	**1.44**	**1.36**	**1**	**1.7**	**1.33**
Daily max. temperature change (degree C)	**1.66**	**1.59**	**1.12**	**1.84**	**1.52**
Daily min. temperature change (degree C)	**1.23**	**1.18**	**0.95**	**1.56**	**1.19**
Mean change air frost days (no of days)	-6	**-0.2**	-2	-12.6	**-22.4**
Percent change in total precipitation (%)	8.4	-5.6	22.3	27	13.6
Mean change in rain days >= 1mm (no of days)	0.5	-0.7	2.9	4.6	5.7

(Bold text indicates a significant trend at the 95% level)

The observed changes in the climate of Wales over the past 45 years are projected to continue throughout the century. Even if we reduced the rate of combustion of fossil fuels to 1990 levels, the concentration of carbon dioxide already in the atmosphere will affect our climate for the next 30 years. Projections suggest that the climate will warm even more, with winter and summer temperatures increasing further. The increased summer warmth will stimulate plants to grow faster, by increasing the rate of photosynthesis. However, this will only happen if there is sufficient moisture available in the soil. Plants require moisture for growth and for accessing nutrients in the soil solution. Future climate predictions show that, on average, summers will be drier and winters wetter. Extreme weather patterns from year to year are also likely to increase. So it is highly likely that there will be sequences of much warmer and drier summers and much milder and wetter winters in the future.

Impact of climate change on trees and woodlands

How do we expect these changes in the Welsh climate to affect trees and woodlands? The effects

are complex and interrelated, and are not fully understood. So here we discuss some of the more likely impacts on woodlands and tree species.

Warmer and drier summers - Growth improves in warmer summers, so the productivity of Welsh woodlands will improve where there is adequate soil moisture. For many species of broadleaved tree the quality of the timber improves when the tree grows quickly. Consequently, in many woodlands on fertile soils, in the more oceanic west and in the valleys of mid-Wales, the prospects for improved growth for all tree species, conifer and broadleaf, is good. However, in the south of Wales, to the east of the Cambrian Mountains, and particularly in the lowlands of Monmouthshire, the climate projections show an increase in the frequency of dry summers (when the total soil moisture deficit exceeds 200 mm). As many forest soils hold only 150-180 mm of moisture that is accessible to plants, woodlands in the drier parts of Wales are likely to experience more frequent summer drought.

Wetter winters - Climate models suggest that winters will become wetter, because the seasonal rainfall distribution will change. Wetter soil conditions, in the autumn in particular, are likely to have an impact on many tree species. On poorly and imperfectly draining soils, this is likely to lead to increased water-logging and anaerobic conditions developing late in the season, with an associated impact on tree root survival in anaerobic soil. Consequently, some species of tree will have reduced rooting depths, leading to a reduction in anchorage and an increase in wind damage. The loss of rooting depth will also lead to increased moisture stress as a result of the tree having access to a smaller volume of soil.

Tree species suitability - Since many species of tree are very long-lived it is important to choose species

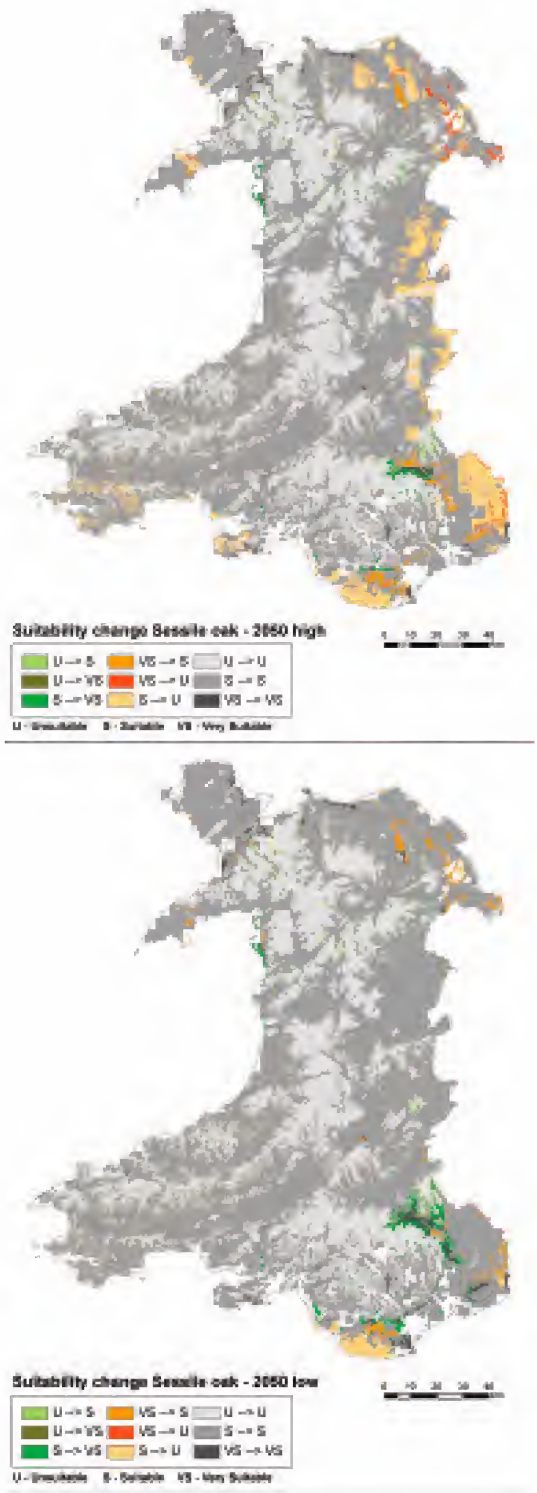


Figure 1: Projected changes in the suitability of sessile oak (*Quercus petraea*) using Ecological Site Classification and the 30 year period climate projections until 2050 For the Low- and High-emissions scenarios (Ray, 2008).

that can cope with the changes in climate on a particular site type. Using a computer-based model that predicts the suitability of sites for trees - Ecological Site Classification (ESC) - it has been possible to map the suitability changes in different future climate scenarios (Figure 1). The model also provides information on the factor that is causing the largest change in the suitability. The outputs are useful in providing an overview of possible changes in tree species suitability in the future climate.

Mild winters and tree health - Tree diseases are very likely to change with the climate. Wetter and milder winters may predispose oak and other broadleaved species to root pathogens such as *Phytophthora cinnamomi*. A build up of *Phytophthora* results in the death of fine feeder roots, and root and stem girdling can also occur. So trees may die suddenly when under water stress or show signs of marked decline. Current evidence suggests that episodes of oak decline are correlated with *Phytophthora* activity and this also predisposes trees to attack by fungi such as *Armillaria* or by bark beetles. Many species of *Phytophthora* can overwinter in soil through mild winters. The predicted milder winters may provide more suitable conditions for many root-attacking *Phytophthoras*. Over the last decade or so red-band needle blight (caused by the fungus *Dothistroma septosporum*) has become widespread in Britain, mainly on Corsican pine, but also on other species of pine, and may become more acute in Wales in the future.

As the climate becomes more favourable, outbreaks of oak processionary moth *Thaumetopoea processionea*, gypsy moth *Lymantria dispar* and the European spruce bark beetle *Ips typographus*, might occur. In spruce forests, population outbreaks of the spruce aphid *Elatobium abietinum* may cause significant defoliation resulting in loss of annual increment. Temperature has an important influence on the population dynamics of this aphid, but so can natural enemies and the nutritional quality of the host, so precise predictions are not possible. Populations of aphids are likely to benefit from the increased incidence of spruce drought stress in parts of east and south Wales, and from milder winters which will permit high over-wintering populations. The mean abundance of *Elatobium* populations seems certain to rise in a warming climate resulting in a general increase in the impact on the growth of spruce.

Mammal populations including those of deer and grey squirrel are likely to increase in milder winters

Jeroen Voogd

Oak processionary moth larvae

Jeroen Voogd

Oak processionary moth

© FCPL

Red-band needle blight has become widespread in Britain

and warmer summers. The availability of food for herbivores will increase, and larger numbers of the population will successfully overwinter in the milder winter conditions with a higher recruitment of young, leading to reduced growth and regeneration. Many insect herbivores will also increase in numbers during the winter months, *Operophtera brumata* and *O. fagata*, the oak leaf roller moth *Tortrix viridana* and the autumnal moth *Epirrita autumnata* are likely to increase in broadleaved woodlands, particularly woodlands of oak and birch. *Operophtera brumata* also extends its host range opportunistically onto Sitka spruce where it can cause significant defoliation damage, leading to reduced growth.

Adapting to the future climate

Climate change adaptation has been defined by international experts as an adjustment in natural or human systems in response to actual or expected changes in the climate or their effects which moderates harm or exploits beneficial opportunities". So to develop successful adaptation strategies for Welsh woodlands, and since trees and woodlands take many decades to mature, foresters must anticipate much further into the future than many other land management sectors. Although our knowledge about the likely effects of climate change is continually improving, we cannot wait until our predictive research is perfect to develop policies that address climate change.

A key concept for adapting Welsh woodlands is the notion of woods that contain mixed tree species, of mixed age structure. The concept requires a change in the woodland management system to low impact silvicultural systems (LISS), and particularly to continuous cover forestry (CCF) systems. The idea is not new to Wales. The strategy document *Woodlands for Wales* (2001) contained an aspiration for an increase in the mixture of species and woodland habitats. Ongoing research on CCF systems in Wales will be particularly useful in establishing where and on which woodland types these systems are appropriate. The transformation to CCF systems is an appropriate adaptation as the systems aim to diversify the species mix of a stand and its age structure.

In addition to species choice, good provenance choice is a valuable adaptation tool. Recent work published by Jason Hubert and Joan Cottrell suggests that when height growth is used as the main criterion for selection, material from up to two degrees of latitude south of the growing site can outperform local provenances. But height improvement is just one of many adaptation traits, and it is the extreme weather events that provide the selection pressure. Therefore it is vital to ensure that species choice is well suited to site conditions and that the selection is adapted to the perceived risks associated with the site.

Five Priority woodland types (UKBAP) are recognised in Wales. Native and semi-natural woodlands provide core woodland habitat for the conservation of woodland biodiversity, particularly those woodlands on ancient and long-established woodland sites. Native woodland communities are in a dynamic balance with climate and other factors such as management, disturbance and soil. Consequently, climate change is very likely to have an impact on Priority woodland communities. Adaptation issues for Priority woodlands should include management to maintain mixed species and age structures within stands, provide a regular supply of deadwood, and encourage the development of a woodland field layer. Such actions will help to maintain high woodland biodiversity, and provide core areas for the colonisation and movement of woodland species in response to climate change. The monitoring of a

sample of Priority woodlands would also help to identify climate-related impacts and help target remedial or adaptive management.

Flooding from intense rainfall events has increased and is likely to continue as a result of climate change. Wet woodlands may have a particular role in attenuating flood peaks. Riparian woodlands in large river valleys, if allowed to flood, can help to hold back peak flows. Research is currently under way in Wales, and it is hoped that this will show how woodlands can provide a natural flood defence system to downstream communities.

Conclusion

Climate change modelling and research never will provide a perfect idea of what will happen in the future, and will always include an element of uncertainty. However, uncertainty is no excuse for inaction and there are 'no regrets' measures that can be implemented now to ensure that Welsh woodlands and the forestry sector continue to supply the needs of society. These recommendations are based on an initial analysis of available data. As more information becomes available we will amend the recommendations to adapt forestry practice to ensure that woodlands continue to provide ecosystem services, and the maintenance of a strong, viable, sustainable and carbon efficient forest industry. This will allow for the continued management of high quality woodlands and the production of top quality woodland goods and services in Wales. Finally, and perhaps most importantly, we need to ensure that the management systems for our woodlands help to maintain and improve the opportunities for future generations to marvel at the subtle back-drop signifying the change in the seasons.

Acknowledgements

We wish to thank Chris Quine (Forest Research) for helpful comments on this article.

Duncan Ray *is a forest ecologist in the Forestry Commission Research Agency (Forest Research) based at the Northern Research Station, Roslin.* ***Richard Carrick*** *works for the Forestry Commission Wales policy team, and is based in Welshpool.*

Cynllunio Coedwigoedd mewn Hinsawdd Newydd

Mae coedwigoedd yn bwysig i bobl a bywyd gwyllt; maen nhw hefyd yn allweddol o ran lliniaru ac addasu i newidiadau yn yr hinsawdd. Anodd yw darogan effaith newid hinsawdd ar goedwigoedd oherwydd eu bod yn systemau mor gymhleth. Gallai hafau cynhesach a gwlypach annog tyfiant coed mewn ardaloedd llaith, go ffrwythlon tra bydd coedwigoedd yn rhannau sychach o Gymru yn dioddef sychder yn amlach. Bydd priddoedd dwrlawn yn yr hydref yn atal gwreiddiau rhag anadlu a datblygu; oherwydd hyn bydd coed dan straen ac yn fwy ansefydlog.

Bydd mwy o heintiau'n ymosod ar wreiddiau coed llydanddail oherwydd y gaeafau tynerach a gwlypach. Bydd trychfilod niwediol, fel y llysleuen sbriws, yn cynyddu am eu bod yn gallu goroesi'r gaeaf ac oherwydd bod coed dan wendid oherwydd sychder. Gallai mamaliaid fel ceirw a gwiwerod llwyd gynyddu hefyd; bydd mwy o fwyd i greaduriaid llysieuol a bydd mwy ohonynt yn goroesi'r gaeaf. Gallai trychfilod llysieuol gynyddu hefyd oherwydd hyn - fel nifer o'r gwyfynod sy'n effeithio ar dderi a bedw, yn cynnwys rhai sy'n gallu troi at goed conwydd masnachol.

Gan fod coed yn tyfu'n raddol, rhaid rhagfynegi'n bell i'r dyfodol wrth greu strategaeth ar gyfer addasu i'r newid hinsawdd. Mae creu coedwigoedd cymysg gyda strwythur oedran amrywiol yn greiddiol i'r strategaeth. Mae hyn yn golygu creu gorchudd coed parhaol a rheoli mewn ffordd nad yw'n creu ardrawiadau mawr. Rhaid dewis mathau o goed sy'n gallu ymdopi gyda newid hinsawdd. Mae tarddiad yn bwysig oherwydd rhaid iddynt ymdopi â'r risgiau penodol sy'n berthnasol i safleoedd gwahanol. Crëwyd modelau cyfrifiadurol i fapio pa mor addas fyddai gwahanol fathau o goed dan wahanol sefyllfaoedd newid hinsawdd. Bydd newid hinsawdd yn siwr o effeithio ar y 5 math o goetir BAP yng Nghymru, ond gyda rheolaeth addas gallent fod yn gronfeydd o rywogaethau a all sefydlu mewn mannau eraill wrth i'n hamgylchedd newid. Ac os bydd mwy o lifogydd gallai coetiroedd gwlyb fod yn ddefnyddiol i reoli eithafion llif a gwarchod cymunedau'n is lawr yr afon - mae ymchwil ar y gweill nawr yng Nghymru ynglŷn â hyn.

Views from a **veteran tree**

A magnificent Oak on the Cleddau Estuary, fighting to stay standing even in the most challenging of positions.

All images: Yun Hider

Woodland ecology has not concerned itself overly with individual trees, but with the habitats dependent on groups of trees. Yet individual trees can themselves form habitats, supporting a wealth of life including rich lichen communities, as ***YUN HIDER*** *explains.*

I've spent the last thirteen years working as a forager, collecting wild vegetables from the forest and down on the beach. Severn years ago I trained as a tree surgeon and I've recently become the Tree Warden for the Cleddau Estuary, a beautiful stretch of water in the heart of the Pembrokeshire National Park. Through these activities I have been given a very privileged insight into the natural world.

Unsurprisingly, I have developed a passion for ancient trees. But what exactly is a veteran tree? The term is used for trees that are of interest biologically, culturally or aesthetically because of their age, size or condition. Although size isn't everything, as a rule of thumb an oak tree with a diameter of more than two metres is likely to be truly ancient.

Lichen

Veteran trees are a principle habitat for lichens. Many lichens are adapted to the sort of niches only veteran trees can provide, such as rain-free crevices and hard, old, bark-free wood. So one definition of a veteran tree is any tree that harbours lichen growth in its nooks and crevices.

Protection of veteran trees and how we can help

In 1993 a group of enthusiasts, both professional and amateur, came together to set up a registered charity called the Ancient Tree Forum. They wanted to act as champions for the ancient tree cause, campaign for their protection, promote best conservation practice and spread the word about their importance. According to the forum, it has been estimated that Britain may be home to around 80% of Europe's ancient trees. "They harbour a unique array of wildlife and echo the lives of past generations of people in ways that no other part of our natural world is able."

The Woodland Trust, in conjunction with the Ancient Tree Forum and the tree register, has initiated a wonderful and much needed project, identifying and protecting these ancient trees. The Ancient Tree Hunt began in 2004. Already several thousand trees have been verified, and the aim is to record 100,000 trees by 2011.

Views from a veteran tree

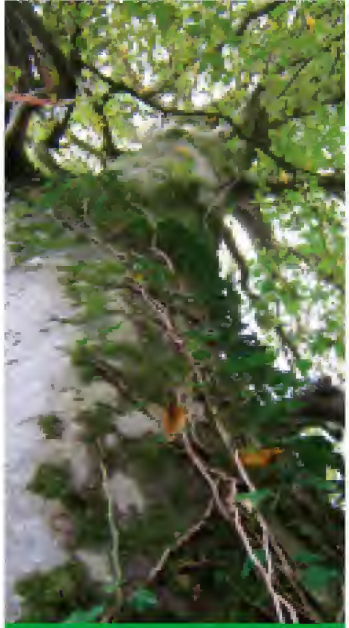
As a tree surgeon and climber I've had the privilege of scaling to the top of various beautiful trees. The breath-taking view from the uppermost branches is worth the exertion of the climb up the trunk and through the canopy. Standing within this structure, sometimes hundreds of years old, is an incredible feeling. The scale is quite daunting.

Sadly, we're often the first and last to enjoy this experience before the surgeon's work begins and this venerable plant is slowly dismantled. Most trees felled are not that old, but some are! Normally, if a tree has survived more than 100-150 years it is likely that it's in a position where it's threatening nobody and can be left to live in peace. The only work required on a tree like this would be the removing of deadwood, dismantling split branches, or removing limbs overhanging a building.

The future for our ancient trees.

Ancient trees can be found in all manner of locations, from old lanes to the grounds of churches, hidden in the heart of old forests or standing as feature trees in our gardens. Eventually all trees' lives will come to an end, but sometimes we can help delay the inevitable. As trees get old, decay can build up to such an extent that some of these great structures need supporting. A tree surgeon can either remove an unbalanced limb or brace it using equipment specifically designed to accommodate the tree's growth and movement throughout the seasons.

Generally, though, trees are quite capable of looking after themselves, sometimes surviving in the most precarious of situations. There are some amazing examples along the Cleddau estuary, where massive trees cling to its high banks as the river and tides slowly erode the waters edge.



Helpu'r Hynafiaid

Mae Prydain yn gartref i 80% o goed hen Ewrop. Dyma farn y Fforwm Coed Hynafol a sefydlwyd yn 1993. Mae 'coed hen' yn ddiddorol o safbwynt eu bywyd gwyllt, eu golwg neu eu cysylltiadau diwylliannol. Bwriad Coed Cadw a'r Fforwm Coed Hynafol yw adnabod a gwarchod y coed hyn. Gobeithir cofnodi 100,000 o goed erbyn 2011. Gwelir coed hen mewn pob math o lefydd – o ymyl lonydd i grombil fforestydd. Gallant ddal eu gafael yn y mannau mwyaf gerwin weithiau, fel ar hyd glannau'r afon Cleddau lle mae'r llanw'n llarpio'r tir. Ychydig ohonynt sy'n cael eu gwarchod gan Orchymyn Gwarchod Coeden. Torrir nifer am resymau diogelwch, ar gwaethaf eu gwerth amgylcheddol. Fel rheol dim ond gwaith tocio a chynnal gofalus sydd angen er mwyn ymestyn eu hoes.

A wyddoch chi am goeden hen sydd angen ei gwarchod? Ewch at www.ancient-tree-hunt.org neu ffoniwch 01476 581111.

With this fast changing environment of droughts, floods and wind, their footing often comes into question. If trees are in reach of a property or a highway or by-way, then they are a potential hazard; if their existence is questioned, then with little consultation they can be condemned. In a world where health and safety is put ahead of everything else, old trees are frequently felled despite their true value. With lifespans of hundreds, if not thousands of years, how can it be that most of these magnificent living structures have no protection? Only the lucky few are protected by a TPO (Tree Preservation Order,) or grow in a conservation area. We need to be more proactive in identifying and preserving our old trees. It can take hundreds of years to replace them, so it's our responsibility to ensure that they are all protected. It's still not too late to make a change, but we must act now and help ensure that our grandchildren have their own veteran trees and woodlands to look after. We can all help with this inspired project. If you know of a tree that you think should be included, simply visit www.ancient-tree-hunt.org.uk or phone **08452 935 581**.

Postscript

I'm extremely grateful for 'the living' provided by the land and feel committed to trying to help look after these precious environments that give us such immense pleasure. My efforts are modest compared to those who have dedicated themselves to the cause of veteran trees; however at long last I'm realising that even the smallest contribution really can help.

***Yun Hider** is a Forager, Tree Surgeon and now Tree Warden.*

Joyce Fleur

Islands Round-up

News from Bardsey (Ynys Enlli)

RSPB now involved with farming the island

The Bardsey Island Trust had to make new arrangements when their farming tenants, David & Libby Barnden, left in May last year. The new set-up is described in the RSPB Wales newsletter *Y Barcud* as "Wildlife wins on Bardsey Island". RSPB Cymru is now the farming tenant; Gareth Roberts, farming at Cwrt farm just across the Sound, owns the sheep and cattle on the island, and is the island farmer. He in turn employs Steve and Jo Porter from Conwy, living year-round on the island with their two children; the Porters are responsible for the day-to-day farm work on Enlli.

The RSPB has, of course, considerable experience working with tenant farmers elsewhere in Wales, and the Bardsey Island Trust will be able to concentrate on the important tasks of maintaining the island houses and providing facilities for day and resident visitors. The RSPB will be working within the parameters of the Management Plan prepared by the Trust, the Countryside Council for Wales, and the Bird & Field Observatory. Those who know the island well will watch with interest.

Observatory Report

The Observatory's report on the island's wildlife in 2007 is now available (details on **www.bbfo.org.uk** or phone **01626 773908**). In addition to the bird data for migrants and breeding birds on Bardsey and the two Gwylan islands in Aberdaron Bay, there are sections on mammals, from cetaceans to mice, and dragonflies, butterflies and moths.

Mike Alexander

Kittiwakes reared 238 chicks on Bardsey this year

Migrant birds in 2007

Apart from the red-flanked bluetail in October, already covered in *Natur Cymru* 26, it was a rather poor year for the migrants which visiting birders come to see. One autumn highlight was an arrival of yellow-browed warblers in October, with five trapped out of 23 recorded. This small relative of the chiffchaff and willow warbler is a rare visitor from the Siberian taiga, the coniferous forest fringing the tundra.

Breeding birds

In contrast to the migrants, the breeding season story was mostly good. Six pairs of choughs raised 23 young, numbers of stonechats, wheatears and chaffinches continued to increase, and goldcrests nested for the second time. Two pairs of peregrines raised six young. Most of the seabirds apart from the large gulls did fairly well, with kittiwakes rearing 238 young, but razorbills and guillemots reared fewer young than normal. Bardsey has not yet suffered the widespread breeding failures of seabirds seen in Northern Britain, but continued monitoring, financed by CCW, is vital.

Porpoises and dolphins

The Whale and Dolphin Conservation Society report on their seventh season is included. In addition to the local porpoises, Risso's dolphins were again seen in August and September. A group of up to 35 on 24th August were followed by boat, and several individuals with distinctive markings were photographed. Very little is known about this species in the north-east Atlantic.

Geoff Gibbs

For details of day trips and weekly stays at Trust houses on Bardsey, see www.enlli.org, or ring ***08458 112233****.*

Achubwch y Gwastadeddau – Dim M4 Newydd!

Roedd y 23ain o Fedi 2008 yn ddiwrnod tyngedfennol. Dyma ddiwrnod cyntaf blwyddyn drafod newydd y Senedd, a glaniodd dros 200 o ymgyrchwyr ar y Cynulliad i leisio'u pryderon dwys am Brosiect M4 Newydd y Senedd, a gynigiwyd ar gyfer SoDdGA Gwastadeddau Gwent.

Pam fod cynifer o bobl wedi troi allan, o bob cwr o Gymru, ar ddiwrnod gwaith, ar fyr rybudd, oherwydd cynllun y mae rhai yn credu iddo gael ei drafod gymaint na fydd byth yn digwydd, ac eraill yn credu ei fod yn anochel? Pam? Oherwydd bod y pwnc hwn o bwys gwirioneddol!

Yn fy marn i, prosiect yr M4 Newydd yw'r bygythiad unigol mwyaf i fywyd gwyllt yng Nghymru ar hyn o bryd. Mae'n drawiadol, ac yn frawychus, bod yna garfan gref o blaid cynllun a fyddai'n gwneud niwed difrifol i fywyd gwyllt o bwysigrwydd cenedlaethol, er mwyn caniatâu mwy o drafnidiaeth ar y ffyrdd.

Mae Gwastadeddau Gwent yn cynrychioli tirwedd gwlyptir isel gorau a mwyaf helaeth Cymru. Mewn llefydd eraill yn ein cefn gwlad cyfoethog ac amrywiol, mae'r gwlyptiroedd wedi'u cyfyngu i'r bryniau, ac i bocedi bach yn y tiroedd isel. Mewn cyferbyniad, mae dros 5,000 hectar o Wastadeddau Gwent wedi eu dynodi'n SoDdGA.

I'r rhai anwybodus, gall Gwastadeddau Gwent ymddangos yn fflat ac yn ddiflas. Fodd bynnag, mae pob cae âr neu borfa wedi ei leinio â ffosydd draenio – sy'n gyforiog o fywyd. Cofnodwyd tua 150 o rywogaethau di-asgwrn-cefn pwysig. Ceir enghreifftiau nodweddiadol o greaduriaid cors bori o ansawdd uchel, fel y gwas y neidr blewog *Brachytron pratense*, y pry milwrol brigadier addurnedig *Odontomyia ornata*, yn ogystal â chwilen fwyaf Prydain, y chwilen arian fawr *Hydrophilus piceus*.

Mae'r alaw lleiaf *Hydrocharis morsus-ranae* a'r llinad diwraidd *Wolffia arrhiza* ymhlith y planhigion gwlyptir sydd i'w gweld. Mae bywyd gwyllt arall y Gwastadeddau'n cynnwys ysgyfarnogod ac amrywiaeth dda o adar tir ffermio, tra bod y llygod dŵr diwethaf y gwyddys amdanynt yng Ngwent newydd gael eu canfod ar linell y ffordd arfaethedig.

Ni fwriedir bellach i lwybr yr M4 Newydd fynd reit drwy ganol Gwastadeddau Gwent, ond byddai'n dal i redeg am bum milltir drwy rannau gogleddol y SoDdGA. Mae ardal yr effaith uniongyrchol yn gyfyngedig, ond mae natur ryng-gysylltiedig y ffosydd draenio yn golygu y bydd y llwyth llygredd yn cael ei daenu'n helaeth drwy'r ffosydd. Byddai'r effeithiau ar fywyd gwyllt yn cynnwys:

- Colli cynefin uniongyrchol – y ffosydd, glaswelltir gwlyb a helyg;
- Darnio cynefin – gyda thair ardal bellennig o SoDdGA'r Gwastadeddau yn cael eu gwahanu oddi wrth y lleill gan y ffordd;
- Llygredd dŵr – bydd y gwaith adeiladu'n achosi newidiadau eithafol yn y ffosydd, a fydd yn parhau i ryw raddau dros y tymor-hir;
- Lladd ar y ffordd – yn enwedig dyfrgwn a thylluanod gwyn.

Nid bywyd gwyllt yw'r unig bryder yn sgîl y cynnig i gael traffordd. Mae iechyd, ansawdd bywyd lleol, trafnidiaeth gynaliadwy, newid yn yr hinsawdd a dyfodol economaidd mwy sicr i Gymru i gyd yn cael eu hamlygu fel problemau gan ymgyrchwyr.

Hyd yn hyn, nid yw Llywodraeth Cynulliad Cymru wedi gallu cynhyrchu Achos Busnes Amlinellol yn cyfiawnhau'r cynllun. Os ydynt yn dal ati, bydd yn rhaid iddynt hefyd argyhoeddi Arolygwr Cynllunio mewn Ymchwiliad Cyhoeddus, sydd yn debyg o gael ei gynnal yn 2010. Mae'r ffordd newydd hon yn ymddangos yn fwy a mwy hen-ffasiwn a rhy ddrud - bydd penderfyniad y Cynulliad ar hyn yn dangos lefel eu hymrwymiad i ddatblygu cynaliadwy.

Rwy'n siŵr nad oes angen M4 Newydd arnom. Mae Gwastadeddau Gwent yn wych ac mae angen i Gymru ganolbwyntio ar werthfawrogi'n treftadaeth naturiol a diwallu anghenion dynol go iawn.

Ymunwch â'r ymgyrch! – ewch i **www.savethelevels.org.uk** neu ffoniwch Ymddiriedolaeth Bywyd Gwyllt Gwent ar **01600 740600**.

JULIAN BRANSCOMBE yw Prif Weithredwr Ymddiriedolaeth Bywyd Gwyllt Gwent, a Chadeirydd yr Ymgyrch yn erbyn Traffordd y Gwastadeddau

Wales and the world

Save the Levels – No New M4!

The 23rd September 2008 was momentous. On this, the first day of the new Senedd debating year, over 200 campaigners descended on the Assembly to voice their deep concerns about the Assembly's New M4 Project, proposed for the Gwent Levels SSSI.

Why had so many people turned out, from across Wales, on a week day, at short notice, for a scheme that some think has been so long in discussion that it will never happen, and that others believe is a foregone conclusion? Why? Because this issue really really matters!

I consider the New M4 project to be the greatest single immediate threat to wildlife in Wales. I find it striking, and horrifying, that there is a strong lobby in favour of a project which would badly damage nationally important wildlife, in order to allow increased road transport.

The Gwent Levels represents Wales' finest and most extensive lowland wetland landscape. Elsewhere in our rich and varied countryside, wetlands are restricted to the hills, and tiny pockets in the lowlands. In contrast, over 5,000 hectares of the Gwent Levels are designated as SSSI.

To the uninitiated, the Gwent Levels can appear flat and boring. However, every arable or pasture field is lined with drainage ditches – known locally as reens – which teem with life. Around 150 significant invertebrate species have been recorded. Characteristic species of high-quality grazing marsh abound, such as the hairy dragonfly *Brachytron pratense* and ornate brigadier soldier-fly *Odontomyia ornata*, as well as Britain's biggest beetle, the great silver beetle *Hydrophilus piceus*.

Frogbit *Hydrocharis morsus-ranae* and rootless duckweed *Wolffia arrhiza* are amongst the wetland plants to be found. Other Levels wildlife includes brown hare and a good range of farmland birds, whilst the last known water voles in Gwent have just been found on the line of the proposed route.

The New M4 route is no longer proposed for the very centre of the Gwent Levels, but it would still run for five miles through the northern parts of the SSSI. The area of direct impact is localised, but the inter-connected nature of the reens mean that the pollution load will be spread widely through the ditches. The wildlife impacts would include:

John Griffith AM, addressing the protesters

GWT

- Direct habitat loss – of reens, wet grassland and willows;
- Habitat fragmentation – with three outlying areas of the Levels SSSI being isolated from the remainder by the road;
- Water pollution – construction will cause extreme changes in the reens, which will continue to a degree over the longer-term;
- Road kills – particularly of otter and barn owl.

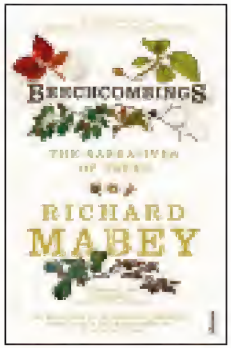
Wildlife isn't the only concern about the motorway proposal. Health, local quality of life, sustainable transport, climate change and a more secure economic future for Wales are all being brought to the fore as issues by campaigners.

WAG hasn't yet been able to produce an Outline Business Case justifying the scheme. If they do persevere, they will also need to convince a Planning Inspector at Public Inquiry, which is now likely to be scheduled for 2010. This new road looks increasingly outdated and unaffordable – the Assembly's decision on this will define the level of their commitment to sustainable development.

I am sure we don't need a New M4. The Gwent Levels are wonderful and Wales needs to focus on valuing our natural heritage and meeting real human needs.

Join the campaign! – visit **www.savethelevels.org.uk** or ring GWT on **01600 740600**.

JULIAN BRANSCOMBE is Chief Executive of Gwent Wildlife Trust, and Chair of the Campaign Against the Levels Motorway



BEECHCOMBINGS
Richard Mabey
Vintage 2008
Paperback £8.99

Beechcombings could be summed up as a book about the relationships between trees and people. This is true, but it is much more than that. It is part historical review of society's attitudes to woods and trees, part critical account of the evolution of nature conservation and perceptions of nature itself, and part autecological portrait of its central character, the beech. And just as fascinating, it is simultaneously about the author himself: a kind of autobiography through ecological symbolism of Richard Mabey.

The book is structured around essays that loosely focus on historical episodes, but which are all subject to freeform diversions into "thickets of natural history", as Mabey pleasingly puts it. There are also frequent encounters with key individuals in the field, past and present, each thoughtfully portrayed. We are guided through the early post-glacial forests and history of beech, the enclosure of common land and the invention of plantations to secure timber supplies for ship building in the 17th and 18th centuries, the development of landscape gardening, trees as status symbols, and the picturesque movement, on into the development of formal nature conservation in the 20th century.

The great storm of 1987 is revealed as a pivotal event, which churned up perceptions of how trees live as much as it disturbed the trees themselves. This helps to crystallise a central theme of this book: the human desire to control trees, expressed through beliefs that trees cannot regenerate or achieve some ideal form without human intervention, and that woods in their wild state are somehow degenerate and best replaced by "perfect" plantations. And modern approaches to nature and biodiversity conservation are not immune to these fundamental biases. We are still almost incapable of allowing trees freedom to express themselves in composition or form, and to regenerate idiosyncratically and naturally, without the need for targets or limits. Mabey goes on to tackle the concept of naturalness itself – a term widely used by ecologists, but rarely defined with consensus. "Naturalness", Mabey states, "is whatever occurs *between* human interventions".

Beech is the central character of the book, giving more than a whimsical title. It is a reference point about which Mabey's stratified narratives can be entwined. The choice of beech for this role is interesting as it is a tree of ambiguity, seen ecologically as the ultimate successional forest tree, but in terms of useful timber, art and spirituality often rated second to species such as the "patriotic" and "paternal" oak. Mabey grew up within a landscape of beech trees, and they have influenced him greatly; in *Beechcombings* he pays tribute to his natural mentor. And there is a serious relevance for our situation in Wales, where beech, although only accepted as native in the southeast, will, with climate change, increasingly have a claim to be a natural component of our woods throughout the country. This is something we will have to adjust to, and it will pay us to listen carefully to Mabey's messages in this elegantly crafted and insightful book.

Jim Latham

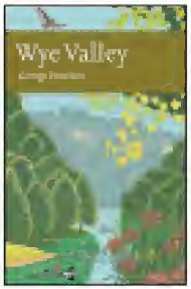
THE BIRDS OF GWENT
WA Venables et al. on behalf of Gwent Ornithological Society. Christopher Helm, 2008
Hardcover £39.99

This, the fifth book on the birds of the county, is substantial in all ways. As Welsh county avifaunas go, it sets a standard far in advance of anything that has gone before. Its 416 pages are packed with detail, comparative tetrad maps from the two breeding atlases carried out in the county mingling with detailed small type-face text and tables of counts or bar graphs. There are also 32 pages of photographs at the front, of habitats or species of interest. To choose a species at

random: the sedge warbler account is two pages long (about 750 words), has two atlas maps, a table of the numbers in each sub-population, another table comparing the two atlases and then a table setting the species in a wider context. Substantial efforts have been made to estimate the population size of commoner species, employing four different methods.

A team of ten writers has been responsible for the species accounts, either writing singly or in combination. This could cause problems of inconsistency but none are apparent. The ancillary sections, such as history of Gwent Ornithology and Geology are well written and clearly laid out and of interest in themselves. A strong, competent editorial hand is evident throughout. This is a book which will not disappoint any purchaser. I can recommend it to anybody interested in Welsh ornithology. The fly in the ointment? The price of £40, which is perhaps going to take it out of the range of an impulse buy for birders from outside the county.

John Lloyd



WYE VALLEY
George Peterken
Collins New Naturalist
2008
Hard cover
£45

After some disappointing editions, such as the one on garden natural history, *Wye Valley* embodies everything that is good about the *New Naturalist* series. Comprehensive and scholarly, it is also engaging; alongside the accuracy is an intimate quality which comes from an author writing about his home patch: something of what Richard Mabey memorably described as "from the hedge looking out". It explores a human landscape where generations have carved out a living, searching for scientific knowledge and beautiful scenery. It also remains a natural landscape, sculpted by time and enlivened by nature in huge variety.

This variety is only a fraction of what it once was. George Peterken's assessment of the state of nature in the AONB recognises the impoverishment of wildlife that has taken place during the recent era of intensive land-use, and the limitations of conservation policy. On the other hand, there are bright spots, such as the difference that individuals have made on their own holdings; and the 'bastion for nature' which woods and plantations provide. Over a fruitful career in nature conservation George Peterken has played no small part in this, insinuating ecology and conservation into forestry policy.

Two factors make this an outstanding volume in an illustrious series. It is written with clarity and verve, which makes it a pleasure to read. Its focus may be geographically small, but its depth is equalled by a breadth of interest which enriches the mix of social history, geography, geology, land use, landscape and ecology. Wye Valley describes a singular piece of country, a borderland on its own, but it can also stand for any place, if you understand enough and care enough about it. This study of the particular is ripe with insights for the general reader.

James Robertson

The Lesser Horseshoe Bat Conservation Handbook **is available from the Vincent Wildlife Trust (vwt@vwt.org.uk) at £19.95.**
With the lesser horseshoe bat continuing to make a comeback in the UK, The Vincent Wildlife Trust has just published the first ever handbook dedicated to the conservation of the species, which is still one of the most endangered bats in the UK. The new lesser horseshoe bat handbook has been written by Trust expert Dr. Henry Schofield as a practical and easy-to-use reference for environmental consultants, conservation bodies, local authorities and conservationists.

THE VINCENT WILDLIFE TRUST

Welsh Institute of Countryside and Conservation Management
Conference, 18-19 November 2008

A traditional view has it that marine and terrestrial nature conservation have little in common. The former has seen itself as a Cinderella, the latter has assumed that marine conservation has to apply different approaches to a different element. The Conference provided an opportunity to demonstrate how much both share, bringing the marine and terrestrial together.

Other bridges were built, for example between the archaeological heritage and nature. Alongside vanishing early human and animal footprints in laminated sediments in the Severn Estuary, was evidence of cranes and aurochsen bones. An archaeological (and more recent) information store surrounds the coast – wrecks, industrial remains, fishing history, and drowned forests. This could be vulnerable to coastal erosion and managed retreat and needs consideration.

The value of understanding history was demonstrated to stunning effect in a talk about the history of fishing. While the effort put into fishing has soared, catches have fallen away dramatically, and are only a fifteenth of what they were a century ago. Many species have been effectively eliminated, including oysters, which once supported a 9 million ton industry. Porpoises were once so common they were described as darkening the waters. Marine conservation has to be bold in the face of the enormous challenge, requiring protection of perhaps 20% - 40% of the sea to bring about recovery.

There were two excellent student presentations, one on an investigation into sightings of dolphins off Aberystwyth, the second on the effects of invasive species, which could sometimes be beneficial. There were talks on keeping outdoor activities sustainable by generating respect for the marine environment from its users; on working with fishermen to generate sustainable fisheries; on the complexities of the long promised Marine Bill; on a coastal footpath; and on Welsh islands, which were the subject of a stimulating final morning.

In one of these, John Rodwell described the changing vegetation of three very similar islands, the scope for being confident about management but also the idiosyncratic nature of the flora. He pointed out that, while he could generalise about his audience, his description would in no way do justice to the heterogeneous collection of individuals in front of him. This, he suggested, was not unlike the limits to the National Vegetation Classification (NVC) for which he is well known: it provides a reasonable generalisation for types of vegetation community, but each individual place has its own unique character, and this is notably true of islands.

At the heart of this talk was a sense of the hold that our 'western seaway' islands have over the imagination, of their 'spirit of place', and this was also apparent in the talk by Tim Birkhead, about the 35 years of monitoring guillemot populations on Skomer. Very much a labour of love, the guillemots were the stars in a story which should convince the most hard-headed 'box ticker' of the value of such long-term monitoring.

It is hoped that both these talks will lead to future articles in Natur Cymru. Contact NATUR (see p48 for details) if you want to find out more about this or future conferences.

The success of the conference was down to organisers and speakers, but also, I suspect, to the stimulating mix of ages and backgrounds within the audience, making it a truly relaxed and educational experience.

James Robertson

Guillemots

Mike Alexander

Nature at large

Will you help keep our Welsh woodland alive?

You can read in this edition of *Natur Cymru* about veteran trees, the woodland that covered medieval Wales and how to adapt our woods to a changing climate. But what can you do to help protect and enhance our native woodland heritage?

Coed Cadw (the Woodland Trust) is the UK's leading woodland conservation charity. By acquiring sites and campaigning for woodland, we aim to conserve, restore and re-establish native woodland to its former glory. Currently we have over 1,000 sites in our care covering approximately 20,000 hectares (50,000 acres). These include over 100 sites in Wales, with a total area of 1,580 hectares (3,900 acres).

We have over 190,000 members, but as we save more woods we need even more supporters. And as well as protecting woodland by acquiring it, we create new native woodland – to date we have planted over 8 million trees! We also speak out for native woodland and its wildlife, and campaign to ensure this voice is heard. We fight to save ancient woods under threat and address the problems which affect our environment. We use our specialist knowledge and experience to help other landowners care for and protect native trees and woodland.

Ancient woodland has survived for centuries. For every new member who joins, we are able to protect half an acre of woodland and ensure this precious habitat is safe for centuries yet to come.

Rory Francis/Woodland Trust

Coed Cadw is working hard to achieve proper protection for individual ancient and notable trees. The Llangernyw Yew, probably the oldest tree in Wales, is estimated to be between 3,000 and 5,000 years old.

At Coed Ysgubor Wen in the Dysynni Valley, we plan to create new native woodland at a 104 acre site opposite Craig yr Aderyn, the famous Bird Rock.

To find out more about Woodland Trust membership, please log on to **www.woodland-trust.org.uk/supportus** or ring **0800 026 9650** during office hours (Monday to Friday, 9am to 5pm) and our membership services team will be happy to help. When you join, we will dedicate a recently planted native tree in your name, plus we will send you a fascinating free membership welcome pack.

RORY FRANCIS is public affairs and publicity officer for Coed Cadw (the Woodland Trust).

Hysbysfwrdd / Noticeboard

If you would like your wildlife event to feature on these pages please contact us on 01248 387373 or email info@naturcymru.org.uk (entries may be edited). Please mention Natur Cymru if you attend any of these events.

North Wales Wildlife Trust

SGWRS A LLUNIAU / ILLUSTRATED TALK gan/by IOLO WILLIAMS
22 Ion/Jan Rhyfeddodau Byd Natur Cymru/ The Wonders of Welsh Wildlife, 7.30pm
Mae gwybodaeth eang Iolo am fyd natur Cymru wedi sicrhau ei fod wedi cael cyfle i gyflwyno rhaglenni gyda'r cwmni teledu annibynnol, Telesgop, ar gyfer S4C, a sawl cyfres gyda BBC Wales. Cyflwynir yr achlysur hwn drwy gyfrwng y Gymraeg ond bydd gwasanaeth cyfieithu i'r Saesneg ar gael.
Iolo's depth of knowledge about Welsh wildlife has led him to present programmes with independent TV company Telesgop for S4C, and several series with BBC Wales. This event will be delivered through the medium of Welsh, and an English translation service will be available. *Tocynnau*/Tickets £10.00 / £8.00 *am ostyngiadau o'r Galeri*/concessions available from Y Galeri, Caernarfon **01286 685222, post@galericaernarfon.com**

National Botanic Garden of Wales

EVENTS
20-21 Dec *Santa Spectacular* Join Santa and his helpers (Llanelli Little Theatre) in the Garden's Winter Wonderland. Children £3.50, parents and carers free.
26 Dec *Boxing Day Delight.* A seasonal stroll in stunning surroundings. Licensed restaurant. 10-4pm. NBGW, Llanarthne, Carms, SA32 8HG; **Tel: 01558 668768 info@gardenofwales.org.uk**

NATUR

CYNHADLEDD RHEOLI CADWRAETH CYMRU WELSH CONSERVATION MANAGEMENT CONFERENCE
11-13 Mawrth *Castell Bodelwyddan. Mae tirwedd Cymru yn rhannol naturiol ac yn rhannol ddiwylliannol – hanes maith o ddylanwadau a chysylltiadau â phobl. Bydd y Gynhadledd yn archwilio'r dirwedd ddiwylliannol yma, yr hyn sydd wedi dylanwadu arni, a sut y gellir ei rheoli er budd y cenedlaethau sydd i ddod.*
11-13 Mar Bodelwyddan Castle. The Welsh landscape is part natural, part cultural - a long history of human associations and influences. The Conference will explore this cultural landscape, the influences that have shaped it and how it can be managed for future generations. **digwyddiadau@natur.eu.com** neu/or **01766 510132**.

School of Education and Lifelong Learning, Aberystwyth

COURSES IN 2009
8 Jan *Introduction to Ecology*, **Cilgerran, Pembs, 10-4pm, £50**
10 Jan *Permaculture - Introduction to Sowing the Seeds of Sustainability*, **Borth, £50.**
15 Jan *Marine Life & Conservation in Cardigan Bay*, **Aberystwyth, 1pm, £50.**
15 Jan *People and the Planet*, **Haverfordwest, 11am, £50**
21 Jan *Applied Ecology*, **Aberystwyth, £50**
16 Mar *Identifying Mosses & Lichens*, **Cilgerran, Pembs, 10-5pm, £65**
23-26 Mar *Conserving Biological Resources in Changing Britain*. **CAT, Machynlleth, £65.**
For details of all courses contact: **learning@aber.ac.uk, 01970 621580**, or see **www.aber.ac.uk/sell**

RSPB

WINTER EVENTS
Newport Wetlands, West Nash Road, Nash, Newport
10 Jan 2009 *Eco trail blazers* 11am-1pm. Solve the puzzles along the trail to find out about the animals that live here. Free. **Tel. 01633 636363.**
2 Feb *World Wetlands Day*. Please note: this event is not organised by the RSPB. Join us for a walk to explore the reedbeds in winter: Cetti's warblers, water rails, tufted duck, pochard, gadwall and goldeneye. Meet in the reserve car park. Further details: **01633 636363**. Free. Send a blank email to **tellmemore@NewportWetlands.com** to receive the latest news.
14 Feb *Magical Mapstick Nature Walk* 11am-1pm. Create your own natural mapstick to explore the sights, sounds and colours of the reserve. Then use it to find your way back. Free. **Lake Vyrnwy Reserve, Powys**
14 Feb *Singles Nature Walk*.Come and join like-minded single nature lovers for a stroll in the woods. Booking essential. 1-3pm. £3.50 adults, RSPB members £1.50. Tel: **01691 870278**

Shared Earth Trust

COURSES 2009
13-15 Mar *Mosses, Liverworts and lichens, an Introduction* £60. Higher Education qualification 10 credits.
21-22 Apr *Phase I Habitat Survey* £150/£100
Contact **01570 493 358**
www.shared-earth-trust.org.uk

Fenn's, Whixhall & Bettisfield Mosses NNR

EVENTS
1 Feb 2009 *Wildlife Gardening Workshop* 10-4pm. Make wildlife homes for your garden with Joan Daniels, with a walk to collect materials from the Moss. Manor House NNR base, Whixall. Caroline Evans **01743 282000 caroline.evans@naturalengland.org.uk** or Joan Daniels **01948 880362, joan.daniels@naturalengland.org.uk**

Wales Biodiversity Partnership

EVENTS
Many partners in the WBP run events. For full listings visit the events calendar at **www.biodiversitywales.org.uk/English/Events/ bioamrywiaethcymru.org.uk/cymraeg/Events/**

Brecon Beacons

NTPL/Joe Cornish

Diolch am y lluniau i / For illustrations, thanks to:
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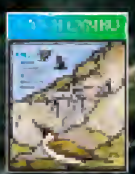

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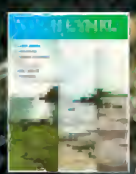

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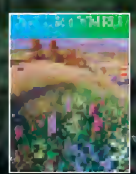

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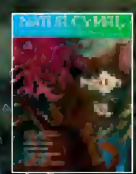

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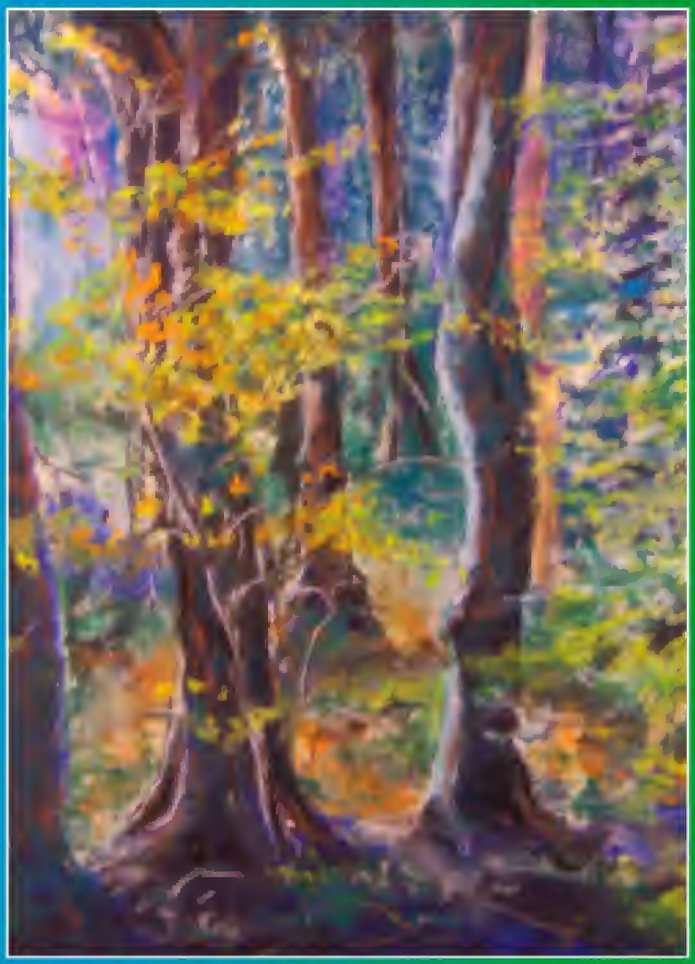

Sian Griffiths

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